IETC INTERNATIONAL EDUCATIONAL TECHNOLOGY CONFERENCE

11th INTERNATIONAL EDUCATIONAL TECHNOLOGY CONFERENCE

Proceedings Book
(Volume I)

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Acknowledgement

Dear Guests…

Welcome to the 11th International Educational Technology Conference IETC-2011.

"The International Educational Technology Conference (IETC)" series is an international educational activity for academics, teachers and educators. This conference is now a well-known educational technology event and the number of paper submissions and attendees increase every year. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities, the conference proceeding book, and the Turkish Online Journal of Educational Technology (TOJET). Its focus is to create and disseminate knowledge about the use of instructional technology for learning and teaching in education. This year, IETC-2011 received almost 500 applications. The conference academic advisory board accepted 350 applications.

The first of "The International Educational Technology Symposium (IETS)" and the second of "The International Educational Technology Symposium (IETS)" were held at Sakarya University in Turkey in 2001 and 2002. The third one was at Eastern Mediterranean University in the Turkish Republic of Northern Cyprus in 2003, and the fourth one at Sakarya University in Turkey in 2004. The fifth International Educational Technology Conference (IETC) was organized at Sakarya University in Turkey in 2005.The Sixth International Educational Technology conference was held in Turkish Republic of Northern Cyprus. In 2007, the seventh conference was organized at Near East University in the Turkish Republic of Northern Cyprus. After then The 8th International Educational Technology Conference was held at Anadolu University in Turkey in 2008. The 9th International Educational Technology Conference was organized at Hacettepe University in Turkey in 2009. IETC-2010 was organized at Bogazici University in 2010. IETC-2011 conference organized at Istanbul University in 2011. IETC-2012 will be organized at Tsinghua University, Beijing, China in 2012.

The International Educational Technology Conference aims to diffuse the knowledge and researches among academicians and lead to development in educational technology and instructional technologies.

Without the authors and participants, IETC-2012 would, of course, have been impossible. We would like to sincerely thank all of you for coming, presenting, and joining in the academic activities. We would also like to thank all of those who contributed to the reviewing process of the “IETC - 2012” conference papers, which will be also published in TOJET. And finally, we would like to thank Sakarya University, İstanbul University, organizing team and The Turkish Online Journal of Educational Technology (TOJET) for successfully organizing and hosting “IETC-2011” in Istanbul, Turkey.

We have lots of participants from 28 different countries. Should you have any enquiries regarding IETC conference, please do not hesitate to contact with us for any additional information you may require.

Finally, we would like to wish you all a pleasant stay in Istanbul-Turkey and safe return back home. I hope that IETC-2011 will be a meeting you will pleasantly remember.

I hope we will meet again at the 12th International Educational Technology Conference - IETC-2012.

Thank you...

Prof. Dr. Aytekin İŞMAN

General Coordinator & Founder of IETC

Editor in Chief of TOJET

May, 20 2011

ÖNSÖZ

Bilişim teknolojilerini, eğitimin her alanında özellikle de sınıf içerisinde etkin olarak kullanabilmek için yoğun bir çaba içinde olan Milli Eğitim Bakanlığı her türlü yenilik ve gelişmeyi, okul yöneticileriyle ve öğretmenlerle buluşturmayı amaç edinmiştir. Her çocuğun özgünlüğünü koruyarak, kendini geliştirmesi, kendisinin farkında olması, özgün ve lider bir kişi olarak yaşamını sürdürmesi hiç kuşkusuz verilen eğitimin niteliği ile yakından ilgilidir. Bakanlığımız, son yıllarda en değerli varlıklarımız olan çocuklarımıza sunulan eğitimin niteliğini en üst seviyeye çıkarmak için çok yönlü çalışmalarla birçok projeyi hayata geçirmeye devam etmektedir. Yürütülen bütün bu projelerin temel amacı; okullarımızı iyileştirmek/geliştirmek, öğretmen, okul ve eğitim yöneticilerinin etkililiğini artırmak ve çocuklara sunulan eğitim imkânlarını en üst noktaya çıkarmaktır. Bir başka ifade ile eğitimde yapılan her türlü reform ve çalışmaların temel amacı; çocuklarımızın kendilerini tanımaları, ifade etmeleri ve kendi potansiyellerini keşfetmelerinin zeminini oluşturan olanakları sağlamaktır.

Bakanlığımız, dünyadaki değişmelere paralel olarak daha iyi bir gelecek için bilişim teknolojilerini merkeze alan, e-Türkiye, e-meb e-toplum, e-eğitim, e-okul, e-gelecek kavramları altında, bilişim teknolojilerini bir amaç değil, milli eğitimimizin temel hedeflerine ulaşması için bir araç olarak görmektedir. Bu bağlamda bilişim teknolojilerinin eğitim ve okul yaşamının her alanında etkin olarak kullanılması temel amaçlarımızdandır.

Bilişim teknolojilerinin eğitimde etkin kullanılması bağlamında önemli projelere ilham kaynağı olan ve gerekli kurumsal bilgileri sağlayan Bakanlığımız ile İstanbul Üniversitesi ve Sakarya Üniversitesi işbirliğinde 25-27 Mayıs 2011 tarihleri arasında İstanbul Üniversitesinde düzenlenen 11.Uluslararası Eğitim Teknolojileri Sempozyumudur. Bu bağlamda bilişim teknolojilerinin öğrenme ve öğretme süreçlerinde etkin kullanılması için akademisyenler ve öğretmenlerimiz tarafından bildiriler sunulmuştur.

Sempozyuma katkı veren, Bakanlığımız çalışanlarına, başta İstanbul Üniversitesi ve Sakarya Üniversitesinin akademisyenlerine, Sempozyum kurullarında yer alan herkese katkı ve katılımlarından dolayı teşekkür eder, başarılarının devamını dilerim.

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Keynotes

Date	Time	Topic	Keynote Speaker
25-05-2011	11:00 - 11:30	Distance Education in Istanbul University	Prof. Dr. Alper Cihan
25-05-2011	11:45 - 12:45	Mobile Learning: Reaching the Tipping Point	Prof. Dr. Terasa FRANKLIN
25-05-2011	14:15 - 15:15	Learner Continuum Model in Knowledge Construction	Prof. Dr. Rozhan M. IDRUS
26-05-2011	09:00 - 10:00	Digital Learning	Prof. Dr. Ian JUKES
26-05-2011	13:30 - 14:30	Shall I watch, listen, do or argue? A journey from page-turning to argumentation in ICT based settings	Prof. Dr. Yavuz AKPINAR
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A COMPARATIVE STUDY OF PROBLEMATIC INTERNET USE AND LONELINESS AMONG TURKISH AND KOREAN PROSPECTIVE TEACHERS

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ABSTRACT

The main aim of this study is to compare the problematic internet use and its relation to loneliness among two nations' prospective teachers, Turkey and South Korea. Five hundred and ninety five prospective teachers from three universities, two from Turkey and one from South Korea participated in the study. Generalized Problematic Internet Use Scale 2 and UCLA Loneliness Scale were used to collect data. Some of the major findings are as follows: a) No differences were found between the problematic Internet use of Turkish and Korean prospective teachers; b) Male Turkish prospective teachers found to have more problematic use of internet than female counterparts on the other hand no differences were found among South Korean prospective teachers by means of sex; c) Positive but low correlations between problematic Internet use and loneliness levels of prospective teachers of both nations.

Key words: Problematic internet use, internet addiction, prospective teachers, comparative study

In today's world technology has been prevalently used in almost all spheres of life and as a consequence the personal ownership ratio of computer and internet is rapidly increasing each year. According to a research on Information Technologies Use employed by Turkish Institute of Statistics, the ratio of computer use and internet access in enterprises was 88,7% and 85,4% in January 2007 whereas in January 2008 these rates respectively increased to 90,6% and 89,2%. In January 2010, the ratio of internet access was 90,9% (Turkish Institute of Statistics, 2011).

Meanwhile, statistics (2011) from the Korea Communications Commission, which is a Korean government organization, show household's computer possession ratio was 80.4% and Internet access ratio was 79.8% except enterprises in 2007, and it was 93.2%, 83.4% in 2010, which was increased 12.8%, 3.8%, respectively. In addition, the subscription ratio of broadband Internet access system has been rapidly increased since 2005. As of 2010, the number of broadband Internet access system's subscribers is estimated that about 37% of the nation's population is exploiting the broadband Internet access system, and the ratio has been sharply increased.

A survey of Internet usage shows the ratio using Internet within recent a month was the average 1.9 hours a day in 2007's statistics and 2.3 hours in 2010, which is analyzed as an increase of 0.4 hour. Especially, as of 2010, average Internet use period of Internet users over age 3 of the Korean is 85.2 months, and the case using Internet for more than 7 years is also founded as 55.1%. Examining the changes of average usage for each year, the case using 'more than once a day' was 77.2%, 'more than once a week' was 21.0% in 2007. Average weekly Internet usage was 13.7 hours, and the case using for more than average 14 hours a week (average 2 hours a day) was also founded as 50.2%. In the 2010's survey, the case using Internet 'more than once a day' is 78.4%, 'more than once a week' is 21.8%, and the average weekly Internet usage is founded as 13.9 hours, which shows it gradually increases.

The reason accounting for this quick rise in internet use is certainly related to the services it provides and its easy access. Internet has been widely used for a variety of purposes in several domains. As stated by Deniz and Coşkun (2004) as an educational tool internet lets access to inexpensive, global, interactive and intensive computer communication and it also enables the student to improve his/her learning experience. Online users can easily access internet from a bunch of locations including their homes, workplaces, houses, school, internet cafes etc. The researches also put forth that (Ceyhan, Ceyhan and Gürcan, 2007; Deniz, 2001, 2007; Deniz and Coşkun, 2004; Tutgun ve Deniz, 2010) most of the students reported to have easy access to computers and internet.

The principal functions of internet are increasing the means of researchers, facilitating the communication and enabling data share however the uncalculated rise of internet use started to introduce several problems as well. Some individuals manage to limit their internet use within the required time whereas certain people face problems at school, work or social life since they fail to draw the boundaries and excessively use the internet. The term internet addiction was introduced for the first time by Goldberg (1996) in a forum website and a list of symptoms was defined. Right after that, incredible numbers of people from the whole world sent their complaints to this forum site regarding internet use. Hence a global research domain emerged and a good number of researchers and clinicians started to conduct studies on internet addiction. The earliest indicators of internet addiction were developed by Goldberg (1996), DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) parallel to the diagnosis measurements of alcohol addiction, subsequently, for internet addiction and internet misuse Young (1996b) developed certain criteria in line with diagnosis measurements of Pathologic gambling presented in DSM-IV (American Psychiatric Association, 1995). Following the cases exemplified by clinicians, a new dispute emerged; whether the internet caused addiction or excessive usage of internet was simply a behavioral indicator of already- existing psychological problems that were manifested through internet (Keser Özcan and Buzlu, 2005; King and Barak, 1999). Further studies employed several new concepts like internet addiction, internet dependency, problematic internet usage, pathologic internet usage, internet behavior addiction and cyber addiction.

Young (1996b) favored the term internet addiction and drew a parallel between internet addiction and drug or alcohol addiction since they all brought about academic, social and professional losses. In subsequent researches, Young (1996b) described “Problematic internet usage” based on “Pathological gambling” criteria (Young and Rogers, 1998; Young, 1996b). According to Young (1996a) problematic internet users who spare little time for real people in life prefer to spend time alone on computer and the same finding is demonstrated in several other researches as well (Deniz and Tutgun, 2010; Kraut, Kiesler et al., 2002). Kandell (1998) defined internet addiction as a psychological addiction which particularly affected teenagers and he emphasized that excessive usage of internet was likely to introduce problems related to health, social relations and time management. The researches covering young population, university students in particular, have manifested rather critical findings and revealed that university students formed the most risky group (Ceyhan, Ceyhan and Gürcan, 2007; Deniz and Tutgun, 2010; Kandell, 1998; Lavin, Marvin et al., 1999; Morahan-Martin and Schumacher, 2000; Tutgun and Deniz, 2010; Young, 2006).

As put forth by Caplan (2005) Problematic internet usage is a multi-dimensional syndrome composed of cognitive and behavioral symptoms causing negative social, academic/professional outcomes. According to this perspective, the term internet addiction on its own is not encompassing enough hence the terms pathologic or problematic have also found place in literature. Afterwards based on the generalized problematic internet usage developed by Davis (2001), Caplan (2010) developed a multi dimensional measurement tool named as Generalized Problematic Internet Use Scale 2 (GPIUS2) according to cognitive-behaviorist model and indicated that people’s self expression habit on internet which is connected to their lack of self trust brought about significant numbers of negative consequences on their lives. In present study too, the measurement tool developed by Caplan (2010) has been used after adapting into Turkey and Korea.

Studies of Problematic Internet Usage in Turkey

Studies of Problematic Internet Usage in Turkey fall short in describing pathological dimensions of internet addiction and researchers relate its causes to several different reasons. Gönül (2002) puts forth that addiction is not to internet but its context and the means it provides. On the other hand the clinicians studying this field in Turkey note that internet addictive users have additional clinical findings (Köroğlu, Öztürk et al., 2006; Odabaşıoğlu, Öztürk et al., 2007; Öztürk, Odabaşıoğlu et al., 2007).

While investigating the causes of problematic internet use, the researchers also attempted to develop measurements tools to determine the problematic internet usage. In Turkey since the measurement tools detecting problematic internet use in particular are limited, these researches have been given priority.

In Keser Özcan and Buzlu's (2005) research, the validity and reliability of Online Cognition Scale developed in 2002 by Davis to detect problematic internet usage amongst the sampling of university students has been examined and adapted into Turkish. The research has been carried out among 148 university students who spent at least two hours online in a week. 73% of students were female (n=108), 27% were male (n=40) and age average of the group was 21.01. 35% of students were (n=53) from social sciences, 27,7% were from (n=41) physical sciences and 12,2% were (n=18) from technical sciences departments.

At the end of this research, parallel to the original scale an Online Cognition Scale with 36-item four-factored (loneliness-depression, lessened motivation control, social support and distraction) has emerged. According to research results, average internet usage of students is 3,17 years; 49,4% connected internet from home, they spent maximum (72.1%) 2-5 hours online in a week, 44% used internet at most between hours 16.00-22.00 and 52,24% spent time on the net for data search mostly, 43,97% made researches for educational purposes and mostly used the net 46,62% for e-mail check. According to the validity and reliability analysis results of the research, validity and reliability data of online cognitive state scale covering Turkish university students are credible enough to be used in researches however due to the restricted use of scale, it is deemed beneficial to analyze the scale among different samplings.

Ceyhan, Ceyhan and Gürcan (2007) in their research have developed a measurement tool to detect problematic internet usage amongst university students. In the research four separate study groups trained at formal programs at Anadolu University have been analyzed. In these four study groups total 2491 university students were present. The research has been executed together with students attending a variety of faculties and colleges. At the end of study, the researchers detected that 5 Likert type scale consisted of total 33 items and in the development stage of scale they manifested that according to the data gathered from 1658 university students, the scale was composed of three factors. Amongst these three factors, the first factor alone named as the negative consequences of internet constituted 25,36% of the variance and second factor alone named as social benefit/ social comfort constituted 14,62% of the variance, third factor alone named as excessive usage explained 48,96% of the variance hence was created the scale termed as Problematic Internet Usage Scale. The specific scale has no objective of diagnosing people with internet addiction by measuring problematic internet usage but aims to exhibit the healthy and unhealthy usage levels of internet.

Kayri and Günüç (2009) conducted a study to detect structural validity and internal consistency coefficient of the Turkish adaptation of Internet Addiction Scale originally developed by Nichols and Nicki (2004). Internal consistency coefficient of the original scale (cronbach alpha) was detected as .95 and explained variance of the scale was found to be 46.50%. The specific scale was executed amongst 233 university students and it aimed to detect internet Internet addiction levels of individuals. Turkish adapted scale consisted of 30 items which were all positive and was scaled with 5 Likert type grading. In Likert form the attitudes were graded as 1- Never 2- Rarely 3-Sometimes 4-Frequently and 5- Always. Certain gaps and Internet addiction levels have been determined according to the scores obtained from scale. Accordingly the ones receiving above 90 scores were categorized as internet addicts. In the same research, 31 university students were grouped as internet addict.

As reported by Öztürk, Odabaşıoğlu et al. (2007) this addiction type comes to surface when the person fails to limit internet usage, keeps staying online despite the social or academic losses or feels deep anxiety when faced with a restriction on internet usage. This addiction type, diagnosed with above-mentioned symptoms, has been extensively analyzed in psychiatry literature since the mids of 1990s. The clinical pictures of excessive internet usage put forth that a typical internet addict spend 40-80 hours a week online and can stay online 20 hours straight. Those patients whose sleep routine is diverted may start to use stimulants, drink excessive amounts of coffee or Coke and as a consequence of lessened physical activity they may face obesity, carpal tunnel syndrome, backache and posture disorders.

In Odabaşıoğlu, Öztürk et al.'s (2007) research case studies have been presented and student groups with different complaints have been examined. The research findings demonstrate that internet addiction that is widely common among teenagers in particular spoils the mental and physical development of patients, adversely affects social relations and academic success as well. As the case studies in research present, age average of 9 male 1 female patient was 14,9, 3 patients were diagnosed with depression, 1 patient

with depression and social phobia, 1 patient with conduct disorder and 2 patients with attention deficit and hyperactivity syndrome. According to the research, there is a 1,5 year period of time changing between 6 months to 3 years prior to misuse or addiction of internet. As the time spent online a week is examined it is found that there is an average of 7-8 hours changing between 4 to 20 hours.

Furthermore in almost all patients the negative academic effects caused by misuse of internet were rather evident, additionally social losses and elevated familial conflicts were the noteworthy consequences of internet addiction. It was further emphasized in the research that internet addiction was equally risky as drug addiction since it also caused social problems so it is likely to become a psychiatric diagnosis in future. As all case studies above are investigated it is detected out that internet addiction, accompanied by many other psychiatric disorders, is likely to exist among young population in particular or in certain cases, although controversial, it is alleged to form a base for the emergence of such disorders.

Tutgun and Deniz (2010) have examined problematic internet usage of prospective teachers in Education Faculties with respect to certain variables (gender, department, university, daily use etc.). The research has been executed among 686 prospective teachers from two universities (Marmara University and Boğaziçi University). Demographic data have been compiled via Personal Information Form and additionally Problematic Internet Usage developed by Ceyhan, Ceyhan and Gürcan (2007) has been used. It has been detected in the research that problematic internet usage of prospective teachers was in medium level. The rest of the findings revealed that with respect to gender, male and female prospective teachers differed in terms of problematic internet usage level.

As the level of daily internet usage rose so did problematic internet usage level and prospective teachers describing themselves fully competent computer users were, compared to the ones feeling less competent, more oriented towards problematic internet usage. Another research finding showed that freshmen students were, compared to senior students, more oriented towards problematic internet usage. The comparison with respect to department indicated that prospective teachers in the Department of Computer and Teaching Instructional Technologies were more inclined to problematic internet usage than the prospective teachers in other departments (Science-Mathematics, Fine Arts, and Social Sciences).

In a different study Deniz and Tutgun (2010) analyzed the relation between loneliness levels and problematic internet usage of prospective teachers. In this study Personal Information Form and Problematic Internet Usage Scale developed by Ceyhan, Ceyhan and Gürcan (2007) as well as Turkish version of UCLA Loneliness Scale adapted by Demir (1989) was employed and the research finding demonstrated that there is a correlation between loneliness levels and problematic internet usage of prospective teachers studying at education faculties. Taking into account the fact that that if a prospective teacher who is expected to be a professional role model in many aspects for students is trapped in problematic internet usage and faces academic, social and familial losses present research signals even more significance to take necessary precautions with no delay.

Odacı and Kalkan (2010) in their research analyzed problematic internet usage among college teenagers and particularly focused on the relation between cognitive states of problematic internet usage and loneliness and flirt anxiety. Additionally internet usage patterns of university students were also examined. The research included 493 students attending Karadeniz Technical University, Fatih Faculty of Education. Research data were compiled via Online Cognitive State Scale, Flirt Anxiety Scale and Personal Information Questionnaire. Research finding put forth that there is a positive and meaningful relation between problematic internet usage and loneliness and flirt anxiety. One-way variance analysis was conducted to detect if or not problematic internet usage varied with respect to internet usage length and it was determined that those spending more than five hours a day online had significantly higher levels of problematic internet usage than the rest.

Chi-square results of the emotional state of students deprived of internet usage and internet usage lengths demonstrated a meaningful relationship. As the problematic internet usage with respect to gender was analyzed it was found out that problematic internet usage of male students was significantly higher than female students.

Studies of Problematic Internet Usage in South Korea

This study shows that it have been actively studied on the Internet addiction at national level as well as general researchers since 2002 in Korea, known as the information technology (IT) is developed throughout the world. In particular, led by the government, the Internet addiction level of the nation for

general people and youths has been analyzed to make public the result every year since 2002. Most of the university hospitals have run rehabilitation programs related to Internet addiction based on the result since 2010. Furthermore, this study found that legislation is recently promoted at the national assembly regarding treatment and improvement for various digital addiction including game addiction as well as Internet addiction.

According to 'Actual condition survey on Internet addiction of Korean in 2010' that is conducted through door-to-door interview methed for the entire people by the Korean government and released in March, 2011, the Internet addiction levels (IALs) of age 9 ~ 39 among the Korean, who use Internet more than once within recent a month, is represented as 8.0% (Ministry of Public Administration and Security, 2010). In the survey for each age group, the numbers of Internet addicted elementary, middle, high school students are 13.7%, 12.2%, 10.0%, respectively, and adult's IALs is estimated 8.0% for 20s, 4.0% for 40s.

Furthermore, the IALs survey conducted according to the home environment for reflecting in the welfare policy shows the IALs is also different depending on income. Regardless of age groups, the IALs survey for each household's income shows the IALs of households below the middle class is the highest of 11.9%, and the case of above the middle class is only 6.6%.

On the other hand, the IALs of the poor reaches 11.1%, in particular, a high-risk group[1] for Internet addiction in this class is as many as 3.7%. Moreover, the high-risk group of one-parent families (7.3%) is more than 2 times than both-parent families (3.0%), and the IALs of multicultural families (37.6%) is high more than 3 times than the average families (12.3%). This result shows the social low-income and neglected groups are likely to be exposed to the risk of Internet addiction more than the above middle class.

Especially, a serious problem is that the entire IALs of youth groups is decreased, however, the number of high-risk youths with a high immersion level of Internet is 3.1%, which shows 3.1% of increase comparing to 2009. In addition, the mobile phone's IALs conducted first in this survey is 11.1%. Therefore, the need of diversified studies is presented according to a qualitative problem of Internet addiction and an introduction of new platforms.

A positive aspect obtained from this result is that the IALs of the entire people has been gradually decreasing from 2004 when the survey was begun. The IALs of the entire people is indicated as the decrease from 8.5% in 2009 to 8.0% in 2010. The IALs of youths is also lowered from 14.4% in 2007 to 12.8% in 2009, 12.4% in 2010. The report says that this is a result from systematic and scientific actions of Korean government and schoolteachers. Therefore, considering the importance that students of their adolescence are in self-formation ages related to a collective-efficacy and self-efficacy for their studies and society, it could be said that a systematic study is very important for PIU dependencies of school teachers including would-be teachers.

However, it is indicated that the high-risk group concentrated in the low-income class is increased from 2.6% in 2009 to 3.1% in 2010. The IALs of elementary school students rises by 2.9% over last year, so it is analyzed that the addiction age group is tend to be lowered. Accordingly, this report suggests an active interest of parents and a necessity of systematic education from kindergarten stage.

Improvements presented in this report by Korean government are active curative measures such as connected implementation of counseling-treatment for high-risk people, training experts for counseling-treatment, expansion of professional counseling organizations for Internet addiction, opening of 'Internet shelter school' using vacation-weekend, provision of mobile counseling services for a neglected class etc., and a necessity of systematic researches and development of a scale according to new technologies such as mobile phones.

Suggestions of active solutions to the problem by Korean government originate from studies' results provided by numerous scholars in the meantime. Studies of scholars performed from 2004 to 2010 in Korea are divided into studies on addiction related to platforms such as Internet, mobile phones, digital

[1] The meaning of the high-risk group noted in this study is a case that the Internet addiction level is at a serious condition requiring counseling treatment based on the scale presented by the medical profession in Korea.

games, portable game players etc. and mixed studies associated with various fields of study such as counseling, legislation etc. Especially, it have been provided the results of studies related to platforms such as mobile phones, portable game players, PMP, MP3 etc. as well as Internet addiction and systematic studies such as rehabilitation treatment program etc. from 2005.

As a result of analyzing top 10 papers with a high quotation index selected from Internet addiction related studies published from 2007 to March, 2011 in Korea through an academic database, most studies for age groups of middle, high school students are represented more than 90%. Recently, the direction of studies also tends to expand into a field of professionals.

Studies could be divided into comparison of Internet symptoms (Lee & Lee, 2004a), pattern analysis of excessive Internet users (Lee & Lee, 2004b), recognitive characteristics according to recognition levels (Chung & Kim,2008), analysis of addiction tendencies related to stress and depression (Park & Park, 2009), development of diagnostic criteria. Generally, it is used the similar measurement scales as cases of general international studies as well as Turkey. However, what's remarkable is that the government and scholars have jointly developed to use independent diagnostic sheets suitable to the Korean sentiment from 2002. Arguably, Even though a platform is the same, there is a slight difference in the use form etc. depending on the racial sentiment (Teo et al., 2008). Accordingly, a supplemented sheet was also developed to release in 2010 (National Information Society Agency, 2010).

Most studies had used the diagnostic scale based on Young's DSM-IV even in Korea before 2002. However, some studies presented a result that most students with high Internet dependencies were under excessive pressure for examinations or homework, and did not manage the study hours efficiently. In other words, as a result, a need is presented to develop an Internet addiction measurement scale (IAMS) reflecting group's characteristics such as occupation, and home environment etc. Based on these studies' results, the Korean government developed a formalized diagnostic scale suitable for the Koreans' characteristics to publish it in 2002 (National Information Society Agency, 2002).

The Korean scale developed by the National Information Society Agency. in 2002 was completed by reflecting the online cognition scale (OCS) of Kim (2001), Davis (2001), the diagnostic scale of Goldberg (1999), results of the National Information Society Agency's study (2002) (National Information Society Agency, 2009). This scale was completed through a standardization procedure of preliminary inspection tables by integrating cases reported by the Internet addiction counseling center, patients, and various mass media (National Information Society Agency, 2009).

Later, the Korean government additionally developed an adult IAMS together with university's institutes in 2005. This measurement scale is subdivided into Internet self-diagnostic scale (A) and observers scale (B) Most people could easily diagnose their own condition by themselves by using this scale. This IAMS is subdivide into general user group (A group), potential risk Ⅰ group, potential risk Ⅱ and high-risk group (D group,) so that they could easily measure by themselves to which group they are belonged (National Information Society Agency, 2009).

In addition, a problem, which the diagnostic sheet of 2005 is too long and complicated, was improved in 2007 to announce development of a simplified self-diagnostic scale for Internet addiction and a practical interview form for field representatives of schools, hospitals, government offices. Furthermore, a nationwide preliminary interview was implemented for the field professionals such as teachers, doctors and the general public to actively reflect the field's demands in 2010. In addition, it was modified the propriety of description methods for questions or ambiguous questions in meaning.

Especially, what's remarkable about development of the diagnostic scale in 2010 is that it developed a scale presenting the standard score for easily classifying into high-risk, potential risk, general user levels of Internet addiction according to the score by everyone through a standardized inspection (National Information Society Agency, 2010).

RATIONALE OF THE STUDY

Internet is commonly used by young population for a variety of purposes. Particularly at universities easy access to internet, the need to study courses or contact with course instructor, desire to contact freely with the opposite sex etc. make the internet use a favorite activity amongst university students.

As relevant literature also puts forward, comprehensive research on the problematic internet usage among university students, points to the gravity of situation. Furthermore university students are more inclined towards developing excessive internet usage-related problems on accounts of various factors containing developmental problems (Ceyhan, Ceyhan and Gürcan, 2007). The tendency of college students to establish close relations with the opposite sex makes the internet usage attractive in their eyes. Besides psychological and environmental factors in university students' lives may drive them to experience internet addiction. It is inevitable that college students with low social skills end up being socially isolated. Internet is a favorite social communication tool for those students feeling lonely; however it is even harder for such students to provide control on the internet. According to Erikson (1998) the principal developmental task of college students is to establish close relations with peers in the same or opposite sex. It is only natural that college youngsters failing to develop social skills in natural social environment end up with familial and business problems in particular as they grow up. The social and academic failures individuals experience due to problematic internet usage that comes to surface during university life may constitute the base for the future loneliness and social isolation and losses in business and family relations. Certain professions, particularly teaching, require social communication skills. A teacher is a role model for students at all times. A teacher who goes through professional and social problems due to uncontrolled internet usage cannot be expected to provide a healthy data transfer to students or be a good role model. Hence further analyses are required to discuss problematic internet usage of prospective teachers studying at faculties of teaching. In that way the problems shall be detected and comprehensive studies to take relevant measurements be conducted.

Due to the restrictions on the researches about problematic internet usage and measurement tools present study employed Turkish and Korean adaptation of the Generalized Problematic Internet Use Scale 2 (GPIUS2) developed by Caplan (2010) and enabled the use of this scale for both countries. Furthermore this study bears additional significance since it analyzes the topic from a cross-cultural perspective by determining internet usage characteristics of the two different countries. As indicated by Caplan (2005) Problematic Internet Usage is a multi-dimensional syndrome. Knowing no bounds in internet usage and consequent problems may vary with respect to age groups, different professional groups, psychological state of individuals, internet usage characteristics etc. Hence it is possible to come across a variety of problematic internet usages with respect to different demographic structures in different countries and also there may be a relation between different characteristics of internet usage and problematic internet usage. Problematic Internet Usage is a prevalent problem all throughout the world. From this point of view it is a must to conduct comprehensive studies covering different cultures and detect whether the responsible causes vary with respect to cross-cultural characteristics. Such researches shall be beneficial in clarifying the factors related to problematic internet usage and also enable to detect characteristics of internet users from different countries and their cross-cultural diversities.

In the present study Turkey and South Korea have been focused in terms of the problematic internet use and its relation to loneliness. Turkey and South Korea are two different countries in many ways, such as economic, cultural, demographic, and geographic and so on. For example in Turkey there are approximately 32,187,000 internet users which consist of 44% of the population while the number and the percentage are remarkably higher in South Korea, respectively 41,363,000 and 84%. This remarkable gap shows itself in the world ranking of these two countries in percentage of internet users in respect to population (Euromonitor International, 2011a, 2011b). South Korea is in the ninth place whereas the Turkey is the fortieth (Internet World Stats, 2011). Network Readiness Index shows that South Korea is one of the best countries (tenth rank) to use ICT effectively as a tool for the structural transformation of South Korean economy and society (World Economic Forum, 2011). Turkey is in the seventy first rank in this index among one hundred and thirty eight countries. In short, although Turkey is supposed to be an emerging market with power of its young and dynamic population it seems to have a digital gap between two countries. Based on these facts a comparative study between Turkey and South Korea about the problematic internet use would help to understand the structure of the topic deeply.

PURPOSE OF THE STUDY

The present study mainly attempts to compare the problematic internet use and its relation to loneliness among two nations' prospective teachers, Turkey and South Korea. Three major research questions were examined to realize the main goal:

1. What are the main characteristics of prospective teachers of both nations in relation to having computer facilities and purpose of using Internet?
2. Are there differences in problematic internet use by prospective teacher characteristics (such as sex, age etc.) within and between the nations?
3. Is there any relationship between problematic internet use and loneliness levels of prospective teachers of the both nations?

METHOD

Participants

Participants were 595 prospective teachers from three universities, two from Turkey and one from South Korea. Marmara University Atatürk Faculty of Education is one of the well known teacher training faculties in Turkey, which is located in Istanbul. The faculty has twenty departments and its prospective teacher (student) population is over seven thousand. Maltepe University is a foundation (private) university located in Istanbul too. The third university from South Korea is Chung Ang University. The ages of the participants ranged from 17 to 37 (M: 21.07; SD: 2.16); and % 68.2 were females in total.

Table 1: Distributions of participants by universities and departments

Departments	Name of Universities			TOTAL
	Maltepe University	Marmara University	Chung Ang University	
English Language Teaching	35 (18.0)	74 (38.1)	85 (43.8)	194 (100)
Early Childhood Education	14 (50.0)	-	14 (50.0)	28 (100)
Educational Sciences	62 (42.5)	48 (32.9)	36 (24.7)	146 (100)
Home Education	-	-	28 (100)	28 (100)
Special Education	19 (100)	-	-	19 (100)
Physical Education	-	-	44 (100)	44 (100)
Primary Mathematics Education	22 (31.9)	47 (68.1)	-	69 (100)
Music Education	-	24 (100)	-	24 (100)
Turkish Language Teaching	-	43 (100)		43 (100)
TOTAL	152 (25.5)	236 (39.7)	207 (34.8)	595 (100)

Data Collection Instruments

Demographic form. A demographic form of 16 questions was used to get data about the some individual characteristics of the sample (sex, age etc.) and some preferences and states in relations to computers (having a computer, time spend using internet etc.)

Generalized Problematic Internet Use Scale 2 (GPIUS2). GPIUS2 developed by Caplan (2010) was used to collect data about the problematic aspects of Internet use of prospective teachers. GPIUS2 has five sub scales, preference for online social interaction (POSI), mood regulation, cognitive preoccupation, compulsive internet use, negative outcomes. GPIUS2 has 15 items and all the items are on a scale ranging from 1 (definitely disagree) to 8 (definitely agree). The higher points show more problematic use. As Caplan indicates (2010, p.1093) GPIUS2 scale can be used in two different ways, as a set of separate sub-scales or as an overall composite index of GPIUS. In the present study the use of composite index of the scale was preferred. The scale's internal consistency reliability was found α= .91 by Caplan. In the present study internal consistency reliability was found α= .89 (α= .89 for Turkish and α= .90 for South Korean participants) which is as high as the original value.

GPIUS2 was translated English to Turkish and Korean in both countries by the experts of language and the field who has studies in computer/internet attitudes. After the translation, the scales were applied to the bilingual (Turkish/English and Korean/English) prospective teachers for test re-tests in three weeks intervals. High correlations and no differences were found (r: .75, p<.001; [paired group] t: .34, df: 25, p>0.05 for the Turkish sample and r: .98, p<.001; [paired group] t: .15, df: 26, p>0.05 for the Korean

sample) between both applications of the Turkish and Korean prospective teachers. The results showed that the language equivalence and internal consistency reliability of the scale was approved for Turkish and Korean versions of GPIUS2.

UCLA Loneliness Scale. The scale developed by Russell, Peplau, & Cutrona (1980) has 20 items on 4 point scale ranging 1 (never) to 4 (often). The reliability and validity of the scale was done by (Demir, 1989) for the Turkish sample. In the present study the internal consistency of the scale was found α= .86 (α= .84 for Turkish and South Korean participants separately).

FINDINGS

The first main research question is to investigate the main characteristics of prospective teachers of both nations in relation to having computer facilities and purpose of Internet use.

Table 2: Having own computer by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Yes, I have	323 (83.2)	183 (88.4)	506 (85.0)
No, I don't have	65 (16.8)	24 (11.6)	89 (15.0)
TOTAL	388 (100)	207 (100)	595 (100)

Table 2 shows that higher percentages of the prospective teacher have computers of their own in both nations.

Table 3: Time spend for chatting in a day by nation

	Turkey	**South Korea**	**TOTAL**
	f (%)	f (%)	f (%)
Never	36 (9.3)	95 (45.9)	131 (22.0)
Less than 1 hour	217 (55.9)	70 (33.8)	287 (48.2)
1-3 hours	114 (29.4)	33 (15.9)	147 (24.7)
4-5 hours	15 (3.9)	7 (3.4)	22 (3.7)
6-8 hours	6 (1.5)	1 (0.5)	7 (1.2)
More than 8 hours	-	1 (0.5)	1 (0.2)
TOTAL	388 (100)	207 (100)	595 (100)

Table 3 shows that 45.9% of South Korean prospective teachers reported that they never used Internet for chatting with someone else while the proportion is 9.3% for Turkish prospective teachers. It is clearly seen that the proportion of Turkish prospective teachers using internet for chatting are remarkably higher than South Korean prospective teachers.

Table 4: Time spend for meeting with new people in a day by nation

	Turkey	**South Korea**	**TOTAL**
	f (%)	f (%)	f (%)
Never	241 (62.1)	158 (76.3)	399 (67.1)
Less than 1 hour	119 (30.7)	40 (19.3)	159 (26.7)
1-3 hours	23 (5.9)	6 (2.9)	29 (4.9)
4-5 hours	4 (1.0)	2 (1.0)	6 (1.0)
6-8 hours	-	1 (0.5)	1 (0.2)
More than 8 hours	1 (0.3)	-	1 (0.2)
TOTAL	388 (100)	207 (100)	595 (100)

Table 4 shows that, parallel to the results of Table 3, higher percentage of prospective teachers (Turkey 62.1% and South Korea 76.3%) from both nations reported that they have never used internet for the purpose of meeting new people. But the distribution among both nations shows that Turkish prospective teachers tend to use internet more hours to meet with new people than South Korean prospective teachers.

Table 5: Time spend for searching for homework in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	22 (5.7)	2 (1.0)	24 (4.0)
Less than 1 hour	180 (46.4)	31 (15.0)	211 (35.5)
1-3 hours	171 (44.1)	115 (55.6)	286 (48.1)
4-5 hours	14 (3.6)	40 (19.3)	54 (9.1)
6-8 hours	1 (0.3)	9 (4.3)	10 (1.7)
More than 8 hours	-	10 (4.8)	10 (1.7)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 5, majority of Turkish prospective teachers spend less than one hour for searching for their homework while majority of South Korean prospective teachers spend 1-3 hours period. Based on the distribution of the data it is clearly said that South Korean prospective teachers seem to spend more time for searching for their homework than Turkish prospective teachers.

Table 6: Time spend for surfing the Internet for new information in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	18 (4.6)	2 (1.0)	20 (3.4)
Less than 1 hour	193 (49.7)	89 (43.0)	282 (47.4)
1-3 hours	154 (39.7)	87 (42.0)	241 (40.5)
4-5 hours	19 (4.9)	16 (7.7)	35 (5.9)
6-8 hours	4 (1.0)	7 (3.4)	11 (1.8)
More than 8 hours	-	6 (2.9)	6 (1.0)
TOTAL	388 (100)	207 (100)	595 (100)

Table 6 shows that very few number of prospective teachers do not use internet for searching new information. The majority of the prospective teachers of both nations spend up to three hours of time for seeking for new information.

Table 7: Time spend for surfing the Internet for reading news in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	58 (14.9)	13 (6.3)	71 (11.9)
Less than 1 hour	232 (59.8)	102 (49.3)	334 (56.1)
1-3 hours	85 (21.9)	72 (34.8)	157 (26.4)
4-5 hours	12 (3.1)	11 (5.3)	23 (3.9)
6-8 hours	1 (0.3)	6 (2.9)	7 (1.2)
More than 8 hours	-	3 (1.4)	3 (0.5)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 7, majority of students in each nation spend less than one hour to read news.

Table 8: Time spend for playing gamble in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	340 (87.6)	199 (96.1)	539 (90.6)
Less than 1 hour	29 (7.5)	5 (2.4)	34 (5.7)
1-3 hours	15 (3.9)	2 (1.0)	17 (2.9)
4-5 hours	3 (0.8)	-	3 (0.5)
6-8 hours	1 (0.3)	-	1 (0.2)
More than 8 hours	-	1 (0.5)	1 (0.2)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 8, playing gamble is not the focus of interest for the majority of prospective teachers of both nations. On the other hand Turkish prospective teachers seem to spend slightly more time playing gamble compare to South Korean prospective teachers.

Table 9: Time spend for searching porno sites in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	344 (88.7)	190 (91.8)	534 (89.7)
Less than 1 hour	36 (9.3)	13 (6.3)	49 (8.2)
1-3 hours	3 (0.8)	4 (1.9)	7 (1.2)
4-5 hours	-	-	-
6-8 hours	1 (0.3)	-	1 (0.2)
More than 8 hours	4 (1.0)	-	4 (0.7)
TOTAL	388 (100)	207 (100)	595 (100)

Table 9 shows that, as in Table 8 for gambling, searching porno sites reported no focus of interest majority of prospective teachers. The rest of the distributions seem to be in balance for both nations.

Table 10: Time spend for playing interaction games in a day by nation

CHATTING	Turkey	South Korea	TOTAL
Never	274 (70.6)	149 (72.0)	423 (71.1)
Less than 1 hour	83 (21.4)	35 (16.9)	118 (19.8)
1-3 hours	24 (6.2)	18 (8.7)	42 (7.1)
4-5 hours	5 (1.3)	2 (1.0)	7 (1.2)
6-8 hours	-	2 (1.0)	2 (0.3)
More than 8 hours	2 (0.5)	1 (0.5)	3 (0.5)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 10, approximately 30% of prospective teachers in each nation spend an amount of time to play interaction games. The majority of the student teachers among the players reported that they spend less than one hour for playing interaction games.

Table 11: Time spend for downloading music in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	101 (26.0)	67 (32.4)	168 (28.2)
Less than 1 hour	183 (47.2)	107 (51.7)	290 (48.7)
1-3 hours	89 (22.9)	24 (11.6)	113 (19.0)
4-5 hours	11 (2.8)	4 (1.9)	15 (2.5)
6-8 hours	2 (0.5)	-	2 (0.3)
More than 8 hours	2 (0.5)	5 (2.4)	7 (1.2)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 11, half of the prospective teachers of each nation spend less than one hour on internet for downloading music. Turkish prospective teachers reported that they slightly more time for downloading music than South Korean counterparts.

Table 12: Time spend for downloading photos in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	121 (31.2)	61 (29.5)	182 (30.6)
Less than 1 hour	207 (53.4)	114 (55.1)	321 (53.9)
1-3 hours	54 (13.9)	20 (9.7)	74 (12.4)
4-5 hours	3 (0.8)	7 (3.4)	10 (1.7)
6-8 hours	2 (0.5)	1 (0.5)	3 (0.5)
More than 8 hours	1 (0.3)	4 (1.9)	5 (0.8)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 12, majority of prospective teachers of both nations reported that they spend less than one hour for downloading photos. The rest of the distribution seems to be balanced for Turkish and South Korean prospective teachers.

Table 13: Time spend for using e-mail in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	24 (6.2)	16 (7.7)	40 (6.7)
Less than 1 hour	259 (66.8)	148 (71.5)	407 (68.4)
1-3 hours	86 (22.2)	23 (11.1)	109 (18.3)
4-5 hours	14 (3.6)	13 (6.3)	27 (4.5)
6-8 hours	3 (0.8)	4 (1.9)	7 (1.2)
More than 8 hours	2 (0.5)	3 (1.4)	5 (0.8)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 13, very low percentages of prospective teachers in each nation seem not to spend time using e-mail correspondence. Majority of prospective teachers reported that they spend e-mail less than one hour a day.

Table 14: Time spend for downloading films in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	174 (44.8)	42 (20.3)	216 (36.3)
Less than 1 hour	118 (30.4)	91 (44.0)	209 (35.1)
1-3 hours	66 (17.0)	61 (29.5)	127 (21.3)
4-5 hours	22 (5.7)	9 (4.3)	31 (5.2)
6-8 hours	3 (0.8)	3 (1.4)	6 (1.0)
More than 8 hours	5 (1.3)	1 (0.5)	6 (1.0)
TOTAL	388 (100)	207 (100)	595 (100)

Table 14 shows that 44.8% of Turkish prospective teachers reported that they have never spent time for downloading films compare to 20.3% of South Korean prospective teachers. South Korean prospective teachers seem to spend more time in internet to download films than Turkish prospective teachers.

Table 15: Time spend for producing/developing web sites/blogs in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	334 (86.1)	90 (43.5)	424 (71.3)
Less than 1 hour	38 (9.8)	87 (42.0)	125 (21.0)
1-3 hours	10 (2.6)	22 (10.6)	32 (5.4)
4-5 hours	6 (1.5)	5 (2.4)	11 (1.8)
6-8 hours	-	-	-
More than 8 hours	-	3 (1.4)	3 (0.5)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 15, majority of Turkish prospective teachers (86.1%) are not interested in spending time for producing/developing web sites or blogs. On the other hand more than half of the South Korean participants reported that they spend some amount of time, mostly less than one hour, for web site or blog production/development.

Table 16: Time spend for shopping on line in a day by nation

	Turkey	South Korea	TOTAL
	f (%)	f (%)	f (%)
Never	286 (73.7)	32 (15.5)	318 (53.4)
Less than 1 hour	82 (21.1)	119 (57.5)	201 (33.8)
1-3 hours	16 (4.1)	41 (19.8)	57 (9.6)

4-5 hours	4 (1.0)	9 (4.3)	13 (2.2)
6-8 hours	-	2 (1.0)	2 (0.3)
More than 8 hours	-	4 (1.9)	4 (0.7)
TOTAL	388 (100)	207 (100)	595 (100)

As seen in Table 16, 73.7% of Turkish prospective teachers reported that they don't spend anytime for shopping online while only 15.5% of South Korean prospective teachers reported in the same way. The data clearly shows that South Korean prospective teachers spend more time than Turkish prospective teachers.

Second main research question is to find out the differences of problematic internet use of prospective teachers by their demographic characteristics. First of all, the data obtained from two main scales of the research, GPIUS2 and UCLA, were analyzed.

Table 17: Problematic Internet Use By Nations

	n	Mean	sd	df	t	p
Turkey	388	39.56	19.36	593	0.33	n.s.
South Korea	207	40.08	16.09			

As seen in Table 17, no differences were found between the problematic Internet use of Turkish and Korean prospective teachers. The means also shows that problematic internet use of the participants is below average which means the Internet is not a problematic medium for both nations' prospective teachers.

Table 18: Loneliness by Nations

	n	Mean	sd	df	t	p
Turkey	388	31.76	9.33	593	11.80	0.000
South Korea	207	40.66	7.55			

Although loneliness, alone, is not the major investigation of this study, results of the Table 19 shows us that there is a significant difference between Turkish and Korean prospective teachers. South Korean prospective teachers were found to be in higher levels of loneliness than Turkish counterparts.

Table 19: Correlation between problematic internet use and age

Problematic Internet Use vs. age	**n**	**r**	**p**
Turkey	388	- 0.12	0.02
South Korea	207	- 0.09	n.s.

As seen in Table 19 the results indicate a negative and low correlation between problematic Internet use and age only in Turkish prospective teachers. The result means that as the age grows up the level of problematic Internet use drops down. It can be explained by being mature as the years pass in relation to proper use of Internet. But on the other side no relationship found for the South Korean prospective teachers. This can be, probably, explained by the age difference of both groups. South Korean participants' age has been found statistically higher (Mean age/Turkish: 20.51, Mean age/S. Korean: 22.13, t: 9.28, $p<0.001$) than Turkish prospective teachers. The way of this difference would be an explanation of the contradictory result.

Table 20: Problematic Internet Use By Sex

	Sex	n	Mean	sd	df	t	p
Turkey	Male	120	43.70	20.31	386	2.84	0.005
	Female	268	37.72	18.67			
South Korea	Male	69	41.75	17.53	205	1.05	n.s.
	Female	138	39.25	15.33			

Table 20 shows that there is a significant difference between male and females in relation to problematic internet use only among Turkish prospective teachers. Male Turkish prospective teachers found to have more problematic use of internet than female counterparts.

Table 21: Problematic Internet Use by Computer Sufficiency

	Sufficiency	n	Mean	sd	F	p
Turkey	Never	8	40.38	24.89	2.09	n.s
	Few	159	36.70	17.72		
	Quite	196	41.35	19.79		
	Completely	25	43.56	22.84		
	TOTAL	388	39.57	19.37		
South Korea	Never	4	36.50	4.65	0.21	n.s
	Few	58	39.40	16.10		
	Quite	121	40.17	15.99		
	Completely	25	41.96	18.30		
	TOTAL	207	40.09	16.10		

Table 21 shows that there is no difference between problematic internet use in relation to computer sufficiency levels of prospective teachers in both nations.

Table 22: Problematic Internet Use by Internet Using Place

	Place	n	Mean	sd	F	p	Difference
Turkey	Home	280	41.03	19.89	3.23	0.02	Home> Internet café Home> Library
	Internet cafe	23	31.74	14.53			
	Library	20	30.85	14.24			
	Other	65	38.72	18.86			
	TOTAL	388	39.57	19.37			
South Korea	Home	157	38.65	15.96	1.96	n.s	
	Internet cafe	3	37.67	19.66			
	Library	27	45.37	17.64			
	Other	20	44.60	12.98			
	TOTAL	207	40.09	16.10			

As seen in Table 22, ANOVA results put differences between problematic internet uses in relation to mostly preferred internet using place among Turkish prospective teachers. The post-hoc LSD analysis revealed that home users seem to have higher problematic levels compared to internet café and library users in Turkey. No differences have been found in South Korean participants.

Table 23: Problematic Internet Use by Time Spend on Internet in a Day

	Time	n	Mean	sd	F	p	Difference
Turkey	Less than 1 hour	141	30.46	13.21	26.56	0.000	Less than 1 hour<1-4 hours Less than 1 hour<5-8 hours Less than 1 hour<+8 hours 1-4 hours<5-8 hours 1-4 hours<+8 hours
	1-4 hours	213	42.70	18.58			
	5-8 hours	26	57.96	24.95			
	+ 8 hours	8	56.75	31.73			
	TOTAL	388	39.56	19.37			
South Korea	Less than 1 hour	23	26.78	11.73	7.16	0.000	Less than 1 hour<1-4 hours Less than 1 hour<5-8 hours Less than 1 hour<+8 hours
	1-4 hours	134	40.82	15.35			
	5-8 hours	36	43.36	15.35			
	+ 8 hours	14	46.50	20.86			
	TOTAL	207	40.09	16.10			

As seen in Table 23 significant differences found between problematic internet uses of prospective teachers in relation to time they spend on Internet in a day. The results show that heavy users have more problematic in Internet use in both Turkish and South Korean prospective teachers. If the analyses have been investigated in details, South Korean prospective teachers who spend less than one hour on Internet in a day have less problematic in internet use than the other heavy users. On the other hand, in Turkish prospective teachers the differences were found between not only among less than one hour and the other heavy users but also 1-4 hours users and the others.

Table 24: Problematic Internet Use By Number of Years Using Internet

	Time	n	Mean	sd	F	p
Turkey	Less than 1 year	9	28.67	10.94	0.92	n.s.
	1-3 years	53	39.26	20.43		
	4-5 years	124	38.98	17.83		
	6-8 years	132	40.98	20.49		
	+8 years	70	39.59	19.78		
	TOTAL	388	39.56	19.37		
South Korea	Less than 1 year	2	25.00	2.83	0.89	n.s.
	1-3 years	6	33.33	14.51		
	4-5 years	17	42.94	20.39		
	6-8 years	39	41.28	13.51		
	+8 years	143	39.92	16.32		
	TOTAL	207	40.09	16.10		

As seen in Table 24 no significant differences found between problematic internet use in relation to the number of years using Internet of prospective teachers in both nations.

Third main research question is to investigate the relationship between problematic internet use and loneliness levels of prospective teachers.

Table 25: Correlation between problematic internet use and loneliness levels of prospective teachers by nations

Problematic Internet Use vs. loneliness	n	r	p
Turkey	388	0.11	0.02
South Korea	207	0.29	0.00

Table 25 shows that there are positive but low correlations ($p<0.05$) between problematic Internet use and loneliness levels of prospective teachers of both nations.

CONCULISION

First, prospective teachers were examined by computer ownership and the purpose of Internet use. The findings show that South Korean prospective teachers have slightly higher percentages (88.4% - 83.2%) of having their own computers. Although this slight difference in favor of South Korean prospective teachers it can easily seen that majority of prospective teachers have computer in both nations.

The purpose of Internet use of Turkish and South Korean prospective teachers shows some differences in many cases. The most remarkable cases are the ones which are related with social interactions. Turkish prospective teachers reported that they spend more time for chatting and meeting with new people than South Korean counterparts. Another difference can be caught in online shopping. Higher percentages of Turkish prospective teachers (73.7%) reported that they have never used internet as an online shopping medium while 84.5% of Korean prospective teachers use some amount of time. Playing gambling and searching porno sites have been reported very low in percentages for both nations' prospective teachers.

The second main research question is to investigate the possible differences on problematic internet use of Turkish and South Korean prospective teachers. No significant differences were found between the problematic internet use of Turkish and South Korean prospective teachers. The level of problematic internet use was also found below average. Male Turkish prospective teachers have significantly higher scores than females while there is no difference in South Korean side by sex. There is a significant

difference ($p<0.000$) between hours spend online in a day and problematic internet use in both nations. On the other hand no differences were found between number of years using internet; computer sufficiency and problematic internet use.

Problematic internet use was positively and significantly ($p<0.05$) related to loneliness. But the levels of the correlations were low. Although it is not the main concern of the present research the loneliness levels of both nations' prospective teachers have been found statistically different. South Korean prospective teachers' loneliness levels were found higher than the Turkish counterparts. It is hard to guess the reasons of this difference but the low percentages of using internet for chatting and meeting new people by South Korean prospective teachers compare to Turkish counterpart should be taken into consideration to make an evaluation of this case.

As the last word, when all the findings evaluated altogether, it would be clearly said that the problematic internet use of Turkish and South Korean prospective teachers seem alike in terms of level and related factors although two countries have been reported (World Economic Forum, 2011) in different technological (network) readiness levels.

It is natural to have some limitations of conducting and interpreting this research as it is the first comparative study in its field between Turkey and South Korea. Further researches should be done to understand the state and effects of information communication technologies on different samples and by using different research methodologies, such as qualitative ones.

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A CROSS-CULTURAL STUDY OF ICT COMPETENCY, ATTITUDE AND SATISFACTION OF TURKISH, POLISH AND CZECH UNIVERSITY STUDENTS

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Abstract

Due to various factors, countries begin to have different levels of information and communication technologies (ICT) and they have their own unique culture of ICT usage. This case appears interesting especially when we consider university students' proficiency, attitudes and satisfaction in use of ICT.

The purpose of this study is to examine the similarities and differences of university students in Turkey, EU candidate, and in Poland and Czech Republic, new members of EU, in terms of their proficiency, attitudes and satisfaction in use of ICT.

The data of this study, composed of open-and closed-ended questions, were collected from students studying at departments of social and computational sciences. Statistical analyses of data collected were performed by SPSS 17, statistical package program.

Results showed that a) despite the fact that Turkish students use computer for a shorter time than Polish and Czech students, there is no statistically significant difference between them, b) in terms of attitudes toward computer and their satisfaction, there is no difference between students studying at social departments whereas there is a statistically significant difference between students studying at departments of computational sciences.

Keywords: ICT competency, ICT attitudes, ICT satisfaction, ICT literacy

Introduction

One of the basic roles of education is to prepare students to information society. This preparation is the most important source of future economic and social development (Hakkarainen et al., 2000). Some instructors argue that learning can be developed and students can be effectively prepared to business areas by integrating technologies and learning processes (Butzin, 2000; Reiser, 2001, Hopson, Simms, & Knezek, 2002).

Nowadays, rapidly increased information has created some important cultural riches in society. Learning and the way how to learn information literacy take an important place in the realization of this richness (Durmus & Kaya, 2010). Reaching information and increasing information literacy are directly related to ICT use, in other words, ICT literacy (ICTL). Although not theoretically clear, researchers and instructors have different descriptions of ICTL and competency which are considered by governments in recent years as an important factor in economic growth and development (Ololube, 2006; Luu & Freeman, 2011). Educational Testing Service (2002) defines ICTL as the ability to use digital technology, communication tools and also the ability to use technology as a tool to research, organize, evaluate, and communicate information. For Katz et al. (2004), ICTL is the ability to use technology as a tool to research, organize, and communicate. Drenoyianni (2004) argue that ICTL is more than the ability to operate a computer system and that ICT literate has to reach, organize and evaluate information.

Despite ICT is considered nowadays as consisting of computer and internet use, ICTL and computer literacy (CL) are two different concepts. Because CL measures skills of computer use whereas ICTL deals with the way how individual reaches information using tools such as computer and internet.

In early years, CL was specifically defined as programming or reprogramming but with newly developed technologies. This definition has to be revised. Even though CL is briefly described as the ability to use computer (Korkmaz & Mahiroğlu, 2009), other definitions exist as well in literature such as "the ability to

control computer and programs in order to attain some goals"; "the ability to use computer for information retrieval, communication and problem solving" (Akkoyunlu, 1996). A good computer literate is expected to turn on computer, to know logic of computer work, its components and how to effectively use computer programs in order to reach information (Walsh, 2007). CL is not considered as a unique domain but divided into sub-domains such as basic computer literacy, programming literacy. Taking into account these definitions, CL can be defined as the ability to do operations relevant to his/her purpose.

In literature, there are several studies researching ICTL and CL. One of these most important and detailed studies is PISA studies, a set of research by OECD (2005, 2006, 2007, 2009). In these studies whose data were collected from developed and developing countries, both national and transnational ICT use was examined, but these studies do not seem to have data regarding students' self-efficacy, attitudes or satisfaction in ICT and computer.

Germany, Poland, Netherlands and Czech Republic are countries having most student exchange programs with Turkey. Among these countries, Poland and Czech Republic, two developing countries like Turkey, are more relevant to conduct a comparative study concerning ICT. Below are presented ICT situations in two countries.

With the reform of the Polish national education system in the school year 1999-2000, ICT has been integrated into almost all school subjects and students began to be prepared to use computers and software in other subjects during separate ICT lessons. Thanks to this reform, ICTL and CL have increased compared to the year 2000 (Gurbiel, Hardt-Olejniczak, Kolczyk, Krupicka, & Syslo, 2005).

As in Poland, some arrangements have also been realized in Czech educational system to become an EU member, special importance has been given to ICT lessons at schools. But ICTL and CL levels did not differ from the previous level as did in Poland.

In Turkey, studies concerning the integration of computer courses in the curriculum began on 1984 but the integration of computer courses in the curriculum from primary school could not be possible until the year 2000 (Er & Güven, 2008). Many studies conducted in Turkey indicated that students had medium or low levels of ICTL and CL (Korkmaz & Mahiroğlu, 2009; Dinçer, 2011). Results also showed that students had low levels of CL due to their lack of personal computers and dissatisfaction about their courses (Dinçer, 2011).

Finally, as a research question, we wished to examine similarities and differences between students in EU candidate Turkey and new EU members Poland and Czech Republic in terms of ICT competency, attitude and satisfaction.

2. Method

2.1. Participants

440 students studying at universities in Turkey, Poland and Czech Republic participated in this study. Students continuing their education at departments of computational sciences in Turkey were compared with students at same departments in Czech Republic; students studying at departments of social sciences in Turkey were compared with students at same departments in Poland. Descriptive statistics related to participating students were given in Table 1.

Table 1 Descriptive statistics of students

	Turkey's Social Students	Poland's Social Students	Turkey's Science Students	Czech's Science Students
Male	32 (7.27%)	30 (6.82 %)	46 (10.45 %)	43 (9.77 %)
Female	113 (25.69 %)	115 (26.14%)	29 (6.59 %)	32 (7.27 %)
Total	145 (32.96 %)	145(32.96 %)	75 (17.04 %)	75 (17.04 %)

2.2. Data Collection and Analysis Procedures

The data of this study were collected from a survey which consists of four parts with open-and closed-ended questions. The first part elicits demographic data; the second part concerns computer and Internet use; the third part examines attitudes toward computers and the final part concerns computer competency.

The survey was administered to volunteer students in Turkey, Poland and Czech Republic during spring semester of the academic year 2010-2011. It was carried out in participants' native language and then was translated into English by translators. Independent-samples t-test and Pearson product-moment correlations were performed using SPSS 17 software, statistical package program.

The computer and Internet use variables were chosen from students survey which encompassed satisfaction (1 = satisfaction, 2 = dissatisfaction); computer ownership (1 = yes, 2 = no); students' experiences with computer and Internet (ranging from 1= "less than one year" to 4= "five years or more") and students frequency of computer and Internet use (ranging from 1 = "almost never" to 5 = "four or more hours a day"). Data concerning students' attitudes toward computers were acquired from attitudes toward computers section in the survey (ranging from 1= "strongly disagree" to 4= "strongly agree"). Computer competency data were gathered from the section "computer competency" in the survey (1= "I don't know what this means"; 2= "I know what this means but I cannot do it"; 3=" I can do this with help from someone"; 4=" I can do this very well by myself"). Other data were collected by open-ended questions.

3. Results

Findings of this study showed that all students studying at departments of social sciences both in Turkey and Poland had informatics courses containing only basic computer topics while a great majority of students studying at departments of computational sciences in Turkey and Czech Republic, besides informatics courses, had other courses such as database, computer hardware, programming, operating system and graphic design.

Students were asked if they have a personal computer and if they are satisfied with computer-related course(s) taken in the university, if not, for what reasons they are dissatisfied. They were also asked how long they have been using computer and Internet, how much time they spend using computer and Internet and for what purposes they use computer and Internet. They were asked about their attitudes toward computers and their computer competency too. An independent-samples t-test was performed to determine if there were statistically significant differences between students. Results are given in Table 2 below.

Table 2 Differences in students' ICT use, competency, attitude and satisfaction

	Social Students								Science Students							
	Turkey			Poland			Difference		Turkey			Czech			Difference	
	N	M	SD	N	M	SD	t	p	N	M	SD	N	M	SD	t	p
Lesson Satisfied	129	1.29	0.46	111	1.16	0.37	2.43	0.16	74	1.35	0.48	68	1.07	0.26	4.22	0.00
Reason of Dissatisfied	32	4.93	1.52	17	2.18	1.01	6.71	0.00	22	3.27	1.03	3	4	1.73	-1.06	0.30
Computer Ownership	145	0.77	0.43	145	0.99	0.08	-6.32	0.00	75	0.99	1.12	75	0.96	1.97	1.01	0.31
Computer Experience Period (year)	145	3.03	1.05	145	3.85	0.57	-8.29	0.00	75	3.49	0.70	75	3.84	0.55	-3.37	0.00
Internet Experience Period (year)	145	2.88	0.99	145	3.86	0.57	-5.98	0.00	75	3.35	0.72	75	3.84	0.53	-4.78	0.00
Computer & Internet Use (hours/week)	145	10.75	5.79	145	14.74	5.62	-5.95	0.00	75	19.01	8.08	75	26.68	7.45	-6.04	0.00
Purpose of Computer & Internet	145	5.78	1.71	145	6.53	1.43	-4.06	0.00	75	6.45	1.73	75	6.31	1.95	0.49	0.63
Computer Attitude	145	2.23	0.62	145	2.13	0.60	1.34	0.18	75	2.60	0.57	75	2.39	0.54	2.35	0.02
Computer Competency	145	3.33	0.39	145	3.42	0.49	-1.69	0.09	75	3.67	0.29	75	3.59	4.43	1.49	0.14

As we see in the table, Turkish (M=1.29, SD=0.46) and Polish (M=1.16, SD=0.37) students studying at departments of social sciences were satisfied with computer-related courses and there was no statistically significant difference between them regarding satisfaction (t (238) = 2.43, p = 0.16). Turkish (M=1.35, SD=0.48) and Czech (M=1.07, SD=0.26) students studying at departments of computational sciences were satisfied with computer-related courses but there was statistically significant difference between them concerning satisfaction (t (140) = 4.22, p = 0.00, p < 0.05).

When students dissatisfied with computer-related courses were asked for what reasons they are not satisfied, a statistically significant difference was found in Turkish and Polish students' reasons for their dissatisfaction (t (47) = 6.71, p = 0.00, p <0.05). However, no statistically significant difference was observed in Turkish and Czech students' reasons for their dissatisfaction (t (23) = -1.06, p = 0.30). While 52.60 % of Turkish students studying at departments of social sciences and being dissatisfied with computer-related courses, told as reasons of their dissatisfaction some hardware problems they confronted in laboratories (computers not working, old hardware, etc.), 38.88 % of Polish students said that they were not satisfied with computer-related courses due to little information. Of all Turkish students studying at departments of computational sciences and being dissatisfied with computer-related courses, 34.63 % showed teachers as reason of this dissatisfaction while little information and newer use are two other factors of dissatisfaction (23.08 % for each). As to Czech students, % 40 of them thinks that little information is the main reason of their dissatisfaction.

When we look at the fact that students participating in this study have or not have personal computers, a statistically significant difference was found between Turkish and Polish students studying at departments of social sciences (t (288) = -6.32, p = 0.00, p < 0.05), but no significant difference was observed between students studying at departments of computational sciences (t (148) = 1.01, p = 0.31). Almost all Polish students (M=0.99, SD=0.08) have a personal computer whereas only three fourths of Turkish students (M=0.77, SD=0.43) have personal computers, which may explain the reason of this difference. Almost all Turkish (M=0.99, SD=1.12) and Czech (M=0.96, SD=1.97) students studying at departments of computational sciences have at least one personal computer.

Findings related to computer experience period showed that there were statistically significant differences both between Turkish and Polish students studying at departments of social sciences (t (288) = -8.29, p = 0.00, p < 0.05) and Turkish and Czech students studying at departments of computational sciences (t (148) = -3.37, p = 0.00, p < 0.05). When we think about the reasons of these differences, we found that Polish students studying at departments of social sciences (M=3.85, SD=0.57) use computers for a longer time than Turkish students (M=3.03, SD=1.05); Czech students (M=3.84, SD=0.55) studying at departments of computational sciences use computers for a longer time than Turkish students (M=3.49, SD=0.70).

Findings regarding Internet experience period indicated statistically significant differences both between Turkish and Polish students studying at departments of social sciences (t (288) = -5.98, p = 0.00, p < 0.05) and Turkish and Czech students studying at departments of computational sciences (t (148) = -4.78, p = 0.00, p < 0.05). When we reflect on the reasons of these differences, we see that Polish students studying at departments of social sciences (M=3.86, SD=0.57) use Internet for a longer time than Turkish students (M=2.88, SD=0.99); Czech students (M=3.84, SD=0.53) studying at departments of computational sciences use Internet for a longer time than Turkish students (M=3.35, SD=0.72).

Findings with respect to weekly computer and Internet use also revealed statistically significant differences both between Turkish and Polish students studying at departments of social sciences (t (288) = -5.95, p = 0.00, p < 0.05) and Turkish and Czech students studying at departments of computational sciences (t (148) = -6.04, p = 0.00, p < 0.05). When we consider the reasons of these differences, we observe that Polish students studying at departments of social sciences (M=14.74, SD=5.62) use computer and Internet for a longer time than Turkish students (M=10.75, SD=5.79); Czech students (M=26.68, SD=7.45) studying at departments of computational sciences use computer and Internet for a longer time than Turkish students (M=19.01, SD=8.08).

Concerning for what purposes students participating in this study use computer and Internet, a statistically significant difference was noted between Turkish and Polish students studying at departments of social sciences (t (288) = -4.06, p = 0.00, p < 0.05) but no significant difference was observed between students

studying at departments of computational sciences (t (148) = 0.49, p = 0.63). 36.60 % of Turkish students stated that they use computer and Internet for academic purposes and 27.60 % for social websites. 36.60 % of Polish students explained that they use computer and Internet for social websites and 27.60 % for surfing on diverse websites. A clear majority of Turkish and Czech students studying at departments of computational sciences (about % 58) use computer and Internet for surfing social and diverse websites.

Findings about students' attitudes toward computers showed that no statistically significant difference was found between Turkish and Polish students studying at departments of social sciences (t (288) = 1.34, p = 0.18) but a significant difference was detected between students studying at departments of computational sciences (t (148) = 2.35, p = 0.02). Results also indicated that Turkish students (M=2.60, SD=0.57) at departments of computational sciences had higher attitudes toward computer than Czech students (M=2.39, SD=0.54). Concerning Turkish (M=2.23, SD=0.62) and Polish (M=2.13, SD=0.60) students studying at departments of social sciences, we found that they have computer attitudes at medium level.

When we analyze CL of students participating in this study, we found no statistically significant differences between students studying at departments of both social (t (288) = -1.69, p = 0.09) and computational (t (148) = 1.49, p = 0.14) sciences. This may be explained by the fact that a great majority of students (% 89.01) had high level of CL.

The Pearson product-moment correlations test was performed to determine if there was a connection between CL levels and personal computer ownership. Results indicated that there was a positive but low relation between CL levels and personal computer ownership (r (438) =0.26, p < 0.01).

4. Discussion and Conclusion

CL levels have increased in parallel with rapidly developing technology (Varol, 2002; Geçer & Dağ, 2010). Correspondingly, societies with high information literacy levels become stronger than other countries in economic, political and scientific fields (Kaya, 1995; Çakmak, 2008). In developed and developing countries, we observe many studies being carried out to enhance information literacy. Generally, the most of these studies aim at increasing ICTL with basic computer courses at educational institutions.

Today, because accessing to electronic information became widespread and local libraries have been replaced by Internet, ICT use was identified with computer and Internet use; ICTL and CL have a linear relationship (Zhang & Espinoza, 1998; Gross & Latham, 2007). Therefore, to comment ICT use competency, attitudes and satisfaction regarding computers, we think it is a good starting point to study computer competency, attitudes and satisfaction about computers.

Although a great majority of students participating in this study indicated that they were satisfied with computer-related courses taken in the university, 16.82 % of them expressed their dissatisfaction. As reasons of their dissatisfaction, Turkish students highlighted computers not working in laboratories, unskilled teachers and some programs they have to take in the curriculum and they will never need in real life while Polish and Czech students said that they were not satisfied with computer courses due to insufficiency of information about computer subjects. As we examined dissatisfaction reasons in Turkish students within hardware problems, we observed computer maintenance problems at universities and increased number of students per computer. We also found out that in basic computer courses, they received standard course content and that, in addition to basic computer courses, they asked for a computer course with contents peculiar to their professional fields (Dinçer, 2011).

Since the cost of information and communication technology has declined, computer and Internet access has become common. It is not wrong to say that students using ICT at home have more ICT experiences (Luu & Freeman, 2011). We believe that this affirmation is verified by the fact that a great majority of students participating in this study had personal computers and that they had a high level of computer competency, and that there was a positive but low relation between computer competency and personal computer ownership. Previous studies also indicated that, for students, being deprived of using computer at home posed a more serious obstacle than being deprived of using computer at school (Moos & Azevedo, 2009), which strengthens this affirmation.

Although Turkish students began to use computer and Internet later than Polish and Czech students, no difference was seen between them regarding their computer competency. It is pleasing to see that Turkish students were as competent as Polish and Czech students despite their late use of computer and Internet.

When we look at findings with respect to weekly computer and Internet use, we observe that Turkish students use computer and Internet for a shorter time than Polish students but for a longer time than Czech students. We note that these differences are associated to fields rather than to countries because Turkish students studying at departments of social sciences use computer and Internet for academic purposes while Polish students use computer and Internet for social websites and for surfing on diverse websites. Reasons of computer and Internet use in computational fields vary. Turkish students, like Polish ones, use computer and Internet for surfing on diverse websites and for social websites. We think it should be useful to associate these differences to social structure and to study students 'social life in accordance with their countries and departments.

Finally, no difference was detected between students regarding their attitudes toward computers. However, we should note that, compared with Polish and Czech students, Turkish students have high attitudes toward computers. But, reasons of theses higher attitudes could not be explained.

As students participating in this study could not easily understand open-ended questions, we suggest, for further studies, collecting data by these questions rather quantitatively. We suggest especially reconsidering reasons of computer and Internet use in connection with countries' socio-economic structures.

Acknowledge

I would like to thank Dr. Filip Nalaskowski and Mb. Přibyslava Hoffmannova, Nuray KUTLAR and Hüseyin DEMIR for their great assistance in the realization of this work. Special thanks go to Dr. Mustafa MAVAŞOĞLU who has served as a continuing source of advice, help, patience, and support.

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A FUZZY LOGIC-BASED QUALITY FUNCTION DEPLOYMENT FOR SELECTION OF E-LEARNING PROVIDER

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The rapid changes and growth in information and communication technologies (ICT) provide significant opportunity to share information resources and knowledge. These developments in the couple of last decades have also led to a valuable contribution for a wide range of learning applications. By increasing usage of internet, e-learning has become an ideal and modern way of distance education. Moreover, distance education is preferred as a valuable way of learning for lifelong learning. At this point, e-learning design is an important issue for better education service. The institutions, which deliver e-learning service via the use of computer and internet, are responsible to choose the most suitable e-learning service provider for effective distance education. Therefore, e-learning provider selection process is essential to increase the e-learning service quality. In this study, fuzzy logic-based quality function deployment (QFD) is employed to identify the e-learning design requirements and to select the most suitable e-learning provider.

Keywords: E-learning Design, Provider Selection, Fuzzy Logic, Fuzzy - Quality Function Deployment, House of Quality, Lifelong Learning.

1. INTRODUCTION

E-learning has become an acceptable and modern way of distance education that is delivered via the use of computers, internet and multimedia presentation (Lau, 2000). According to the Internet World Stats (2010), the growth rate of internet usage in the world is 444.8 % from 2000 to 2010. Since the number of internet users is rapidly increasing with each passed year, e-learning is often identified with web-based learning. The QFD process requires various inputs which are also in the form of linguistic data (human perception, judgment, and evaluation on importance of customer requirements or strengths of relationship between customer requirements and technical attributes) that is quite vague and subjective (Chen et al., 2006). Although it is really important to overcome the vagueness and imprecision in human thought for operative judgment and decision making, most of the input variables in traditional QFD are represented with crisp numerical values that also cause precise judgments. In this study, fuzzy logic based QFD is employed to deal with the vagueness of human thought for selection of e-learning provider.

2. THE CONCEPT OF ONLINE EDUCATION FOR LIFELONG LEARNING

As an education expert in lifelong learning, John Field defined lifelong learning as a “relative new concept” although it has traditionally been known as adult education (Field, 2003). Lifelong learning is also meant to symbolize a second chance for individuals to update their skills and qualifications. Higher education institutions have an important role to develop and provide learning opportunities for individuals. E-learning indicates a radical change in learning paradigm (Lee et al., 2007). Furthermore, in comparison to traditional learning process in e-learning process participants need to have several characteristics, such as self-motivation and self-discipline that contribute to success in e-learning process (Bose, 2003). These features make e-learning a viable learning option for lifelong learning.

3. METHODOLOGY

3.1. Fuzzy Set and Linguistic Variables

In order to deal with the vagueness of human thought, Zadeh (1965) first introduced the fuzzy set theory, which was oriented to the rationality of uncertainty due to imprecision or vagueness. Especially in group decision-making process, there is also an internal uncertainty based on distinctive characteristics of the all individual decision makers. A major contribution of fuzzy set theory is its capability of representing vague data. In fact, the fuzzy set theory is a generalized form of the classical set theory that has membership functions with values in [0, 1]. A fuzzy set is a class of objects with a continuum of grades of membership. Such a set is characterized by a membership (characteristic) function, which assigns to each object a grade of membership ranging between zero and one. A tilde "~"is placed above a symbol where the symbol represents a fuzzy set. A triangular fuzzy number is denoted simply as $(\frac{\alpha}{\beta},\frac{\beta}{\gamma})$ or (α, β, ɣ). The parameters α, β and, ɣ respectively denote the smallest possible value, the most promising value, and the largest possible value that describe a fuzzy event (Kahraman et.al., 2003). To aggregate all individual decision makers' opinions, a common measure is needed. Therefore, the fuzzy linguistic variables are used to represent the different aspects of human language. It also allows us to use the fuzzy linguistic variables for human words and sentences with numerous linguistic criteria, such as very low, low, medium, high, very high. The linguistic terms and corresponding fuzzy numbers are shown in Table 1.

Table 1 Linguistic Term and Corresponding Fuzzy Numbers

	Linguistic Term	Fuzzy Number
(VH)	Very High	(8,9,10)
(H)	High	(6,7,8)
(M)	Medium	(4,5,6)
(L)	Low	(2,3,4)
(VL)	Very Low	(0,1,2)

3.2. Defuzzification Method

Defuzzification is a process which needs to evaluate that a fuzzy number is characterized by its shape, spread, height, and relative location on the x-axis (Opricovic & Tzeng, 2003). In this study, the CFCS (Converting Fuzzy data into Crisp Scores) defuzzification method is executed through fuzzy aggregation procedure. The CFCS defuzzification method was first proposed by Opricovic and Tzeng (2003). By determining the left and right scores, the CFCS method provides fuzzy max and fuzzy min of fuzzy numbers. According to the membership functions of the fuzzy numbers, the total score is computed with a weighted average. If $\tilde{z}_{ij}^{d} = (\alpha_{ij}^{d}, \beta_{ij}^{d}, \gamma_{ij}^{d})$ is given for the fuzzy evaluations of decision maker d (d = 1,2,…,n) about the degree to which the criterion *i* affects the criterion *j*. The CFCS defuzzification method includes five-step algorithms described in Fig. 1:

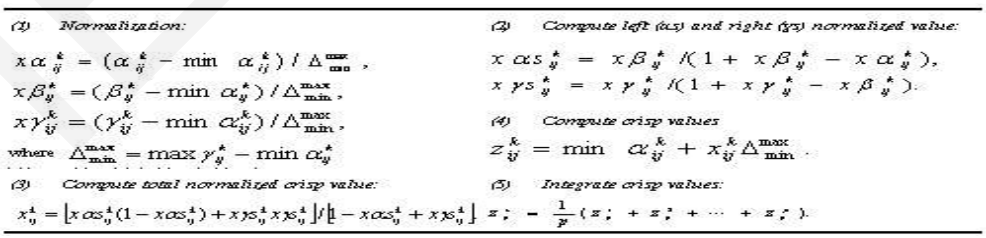


Figure 1 CFCS Deffuzzification Steps

3.3. Fuzzy - Quality Function Deployment

Quality Function Deployment is a useful tool for total quality management to develop new products and services. Furthermore QFD helps to improve the features of existing products and services. It was developed in late 1960s in Japan, by Yoji Akao (Akao, 1972). QFD charts are filled through various inputs such as questionnaires, interviews and focus groups. This increases the uncertainty in the quantification of the information. The linguistic variable is useful in dealing with situations that are

identified in quantitative expressions (Wang and Chuu, 2004). In order to decrease the uncertainty in the data collected, fuzzy logic can be used (Bouchereau and Rowlands, 2000). To address the ambiguity in QFD process, there are some researches are conducted-Temponi et al. (1999) Bevilacqua et al. (2006), and Wang (2010). The QFD process contains four phases. The house of quality matrix is usually called as the phase one matrix, or the planning matrix (Hauser and Clausing, 1988) that is shown in Fig. 2. The HOQ is described and its process following approaches suggested by Brown (1991), and Griffin and Hauser (1992).

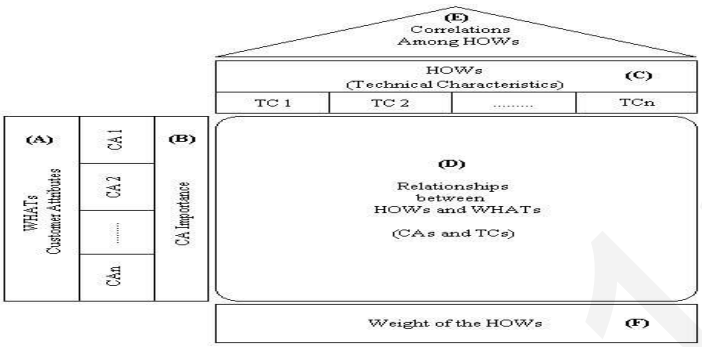


Figure 2 House of Quality

Step 1-*Identifying process of the WHATs:* In this step, the process includes the determination of customer needs, the assignment of priorities to customer attributes (CAs), and the evaluation of the customer's perception are needed (Temponi et al., 1999). The wanted benefits in a product or service in the customer's own words are customer needs and often called (CAs) or "WHATs" area (A) in Fig. 2. This step depends on expertise of the team members (Griffin and Hauser, 1992).

Step 2-*Determination process of the HOWs:* Technical characteristics (TCs), which are also called measurable requirements, are stated as the "HOWs" of the HOQ. TCs are determined by a multidisciplinary team and located on the area marked as (C) in Fig. 2.

Step 3-*Preparation of the relationship matrix:* TCs, which impact on which CAs, are judged by a team. Likewise, it is really important to identify the influence degree of TCs. This relationship between TCs and CAs is shown in the area identified as (D) in Fig. 2.

Step 4: *Elaboration process of the correlation matrix:* The physical relationships among the technical requirements are specified on an array known as "the roof matrix" and identified as (E) in Fig. 2.

Step 5: *Action plan:* The weights of the TCs, identified as area (F), are placed at the base of the quality matrix. The weights are one of the main outputs of the HOQ, and are determined by:

$$Weight(\mathrm{TC})_i = V(\mathrm{TC})_{i1} \times Im(\mathrm{CA}_1) + \ldots + V(\mathrm{TC})_{in} \times Im(\mathrm{CA}_n), \quad (1)$$

where $V(TC)_{in}$ is the correlation value of TC_i with CA_n, and $Im(CA_n)$ represents the importance or priority of CA_n.

4. APPLICATION – CASE STUDY

In this study, an illustrative case is presented. An educational institution, which aims to provide online education for lifelong learning program, is described figuratively. Otherwise, as e-learning service providers, 5 firms (A, B, C, D, and E) which have operations in the e-learning service industry, are selected. The e-learning provider selection model is identified by the following steps:

4.1. Selection of the Decision Makers

In this study, decision makers are selected for data collection according to their expertise in related industry. Most of the decision makers are managers/executives of e-learning users at the institutional

level. 10 potential decision makers were selected and sent the invitations for this research. Moreover, in order to help the identification process of HOWs and WHATs, a broad literature research is served (Bevan, 1999; Brajnik, 2001; Signore, 2005; Li et al., 2009).

4.2. Determining the Linguistic Terms and Corresponding Fuzzy Numbers

To aggregate each decision makers' opinions, the linguistic variables in Table 1 are employed. These variables are Very High (8;9;10), High (6;7;8), Medium (4;5;6), Low (2;3;4) and Very Low (0;1;2).

4.3. Identifying WHATs

In this step, to identify WHATs, as mentioned above, a wide-range literature review is condensed and each decision makers are asked to identify which quality characteristics should be used in this research. After each decision makers' evaluation, 10 attributes are identified and shown in Table 2a.

Table 2 Identified WHATs and HOWs

(a)

WHATs		
1	AE	Aesthetics
2	FC	Functionality
3	RL	Reliability
4	US	Usability
5	EF	Efficiency
6	MT	Maintainability
7	PR	Portability
8	RC	Rich Content
9	CS	Customer Support
10	CT	Cost Effectiveness

(b)

HOWs		
1	CE	Certificated Education
2	TC	Technical Capability
3	QC	Quality Certification
4	RP	Reputation
5	FS	Financial Stability
6	EI	Experience in the Industry
7	QDT	Qualified and/or Experienced Design Team
8	QSS	Qualified Support Service Staff

4.4. Identifying HOWs

In order to identify HOWs, each decision maker is asked to determine which factors are important to meet the CAs for evaluating e-learning service providers. Identified HOWs are shown in Table 2b.

4.5. Calculating the Importance Degrees of WHATs

In this step, each decision maker is asked to evaluate the importance degrees of WHATs. By using the arithmetic mean method, importance degrees of WHATs are calculated. The importance degrees of each WHAT are shown in Fig. 3.

4.6. Identifying the Correlation between HOWs and WHATs

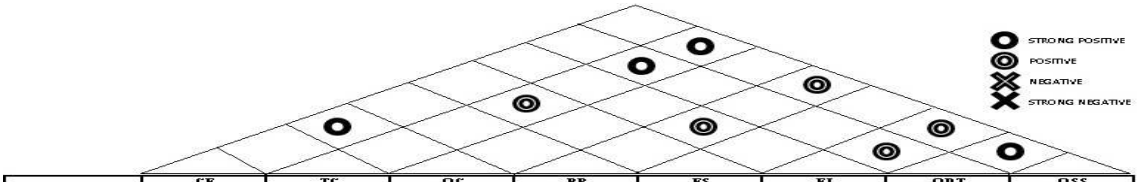
To identify the correlation between HOWs and WHATs, each decision maker is asked to evaluate the impact of each HOW on each WHAT. An evaluation example of a decision maker is shown in Table 3. Calculated correlation values are shown in Fig. 3.

Table 3 A Decision Maker's Evaluation of the relationship between HOWs and WHATs

	UF	TC	QC	RP	FS	EI	QDT	QSS
AE	L	H	VH	H	VH	H	VH	H
FC	M	H	VL	M	H	VL	VL	VH
RL	L	VH	VH	L	VH	VH	L	M
US	VH	VH	VL	VH	VH	VL	H	L
EF	M	VL	L	M	VL	L	H	H
MT	VH	L	H	VH	L	H	VH	L
PR	VL	VH	VL	VL	VH	VL	L	L
RC	H	M	L	H	M	L	M	H
CS	H	L	H	M	VL	VL	L	VH
CT	H	M	H	L	H	L	H	VH

4.7. Computing the Weights of HOWs

By using Eq. (1), weights of HOWs (W_i) are calculated. The calculated values are shown in Fig. 3.



	CE			TC			QC			RP			FS			EI			QDT			QSS		
	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ
AE	3,33	4,33	5,33	1,67	2,17	2,67	2,33	2,83	3,33	3,67	4,17	4,67	3,33	3,83	4,33	3,67	4,17	4,67	3,33	3,83	4,33	3,67	4,17	4,67	3,33	3,83	4,33
FC	4,33	5,33	6,33	2,33	2,83	3,33	3,00	3,50	4,00	1,33	1,83	2,33	2,33	2,83	3,33	3,00	3,50	4,00	1,33	1,83	2,33	1,33	1,83	2,33	2,67	3,17	3,67
RL	3,00	4,00	5,00	2,00	2,50	3,00	2,00	2,50	3,00	2,00	2,50	3,00	2,00	2,50	3,00	2,00	2,50	3,00	3,00	3,50	4,00	1,33	1,83	2,33	1,67	2,17	2,67
US	3,00	4,00	5,00	2,67	3,17	3,67	3,67	4,17	4,67	2,33	2,83	3,33	2,67	3,17	3,67	3,67	4,17	4,67	1,67	2,17	2,67	2,33	2,83	3,33	1,67	2,17	2,67
EF	5,33	6,33	7,33	1,67	2,17	2,67	2,33	2,83	3,33	2,67	3,17	3,67	1,67	2,17	2,67	2,33	2,83	3,33	1,67	2,17	2,67	3,33	3,83	4,33	2,67	3,17	3,67
MT	5,00	6,00	7,00	3,00	3,50	4,00	2,00	2,50	3,00	2,67	3,17	3,67	3,00	3,50	4,00	2,00	2,50	3,00	2,67	3,17	3,67	2,67	3,17	3,67	1,00	1,50	2,00
PR	4,00	5,00	6,00	1,33	1,83	2,33	2,67	3,17	3,67	1,33	1,83	2,33	1,33	1,83	2,33	2,67	3,17	3,67	2,67	3,17	3,67	0,67	1,17	1,67	2,00	2,50	3,00
RC	4,67	5,67	6,67	2,33	2,83	3,33	1,67	2,17	2,67	1,00	1,50	2,00	2,33	2,83	3,33	1,67	2,17	2,67	1,33	1,83	2,33	2,33	2,83	3,33	3,33	3,83	4,33
CS	4,67	5,67	6,67	2,33	2,83	3,33	1,67	2,17	2,67	1,67	2,17	2,67	1,67	2,17	2,67	1,00	1,50	2,00	1,67	2,17	2,67	2,00	2,50	3,00	2,67	3,17	3,67
CT	5,33	6,33	7,33	2,67	3,17	3,67	2,33	2,83	3,33	2,67	3,17	3,67	1,67	2,17	2,67	2,33	2,83	3,33	2,67	3,17	3,67	3,33	3,83	4,33	3,67	4,17	4,67
	W1			W2			W3			W4			W5			W6			W7			W8		
	9,97	14,95	20,93	10,07	15,05	21,03	9,99	14,97	20,96	9,93	14,88	20,83	11,27	16,52	22,77	11,71	17,03	23,34	10,73	15,88	22,03	12,09	17,47	23,86			

Figure 3 The Fuzzy - House of Quality

4.8. Measuring the Correlation of HOWs

In this step, each decision makers are asked to evaluate the correlations of HOWs. The result is shown in the roof matrix in Fig. 3.

4.9. Determining of E-learning Providers' Influence on the TCs

To determine of e-learning providers' influence on the TCs, each decision makers' opinions are collected according to the relationship between TCs and providers. Aggregated values for each provider are given in Table 5.

Table 5 E-learning Providers' Influence on each attribute

	CE			TC			QC			RP			FS			EI			QDT			QSS		
	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ	α	β	χ
A	2,67	3,17	3,67	2,33	2,83	3,33	2,67	3,17	3,67	1,67	2,17	2,67	3,67	4,17	4,67	3,33	3,83	4,33	3,67	4,17	4,67	3,33	3,83	4,33
B	0,67	1,17	1,67	2,00	2,50	3,00	2,67	3,17	3,67	0,67	1,17	1,67	0,67	1,17	1,67	3,67	4,17	4,67	1,33	1,83	2,33	2,67	3,17	3,67
C	1,33	1,83	2,33	1,67	2,17	2,67	1,33	1,83	2,33	1,67	2,17	2,67	1,33	1,83	2,33	1,33	1,83	2,33	1,33	1,83	2,33	1,67	2,17	2,67
D	3,67	4,17	4,67	3,00	3,50	4,00	3,67	4,17	4,67	1,67	2,17	2,67	3,67	4,17	4,67	3,33	3,83	4,33	3,67	4,17	4,67	3,33	3,83	4,33
E	2,67	3,17	3,67	2,00	2,50	3,00	2,67	3,17	3,67	1,67	2,17	2,67	1,67	2,17	2,67	2,33	2,83	3,33	2,33	2,83	3,33	2,33	2,83	3,33

4.10. Converting Fuzzy Scores to Crisp Scores for Ranking Each E-learning Provider

In order to rank each e-learning provider (Pr), CFCS defuzzification method is employed as mentioned above. Then, each provider weight is calculated by using the following equation. The scores and rank of each e-learning provider are shown in Table 6.

$$Weight(P)_i = V(Pr)_{i1} \text{ x } Im(TC_1) + \ldots + V(Pr)_{in} \text{ x } Im(TC_n)/P_n \quad (2)$$

Table 6 Scores and Rank of E-learning Providers

Providers	SCORE	RANKING
A	50,714	1
B	38,251	4
C	32,537	5
D	48,581	2
E	42,827	3

5. DISCUSSIONS AND CONCLUSION

According to the evaluations of each decision maker, e-learning provider A is estimated as the best choice, but the other provider C is seen as the worst choice. By using this proposed method, an alternative way of provider selection is described.

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A HO-IRT based diagnostic assessment system with constructed response items

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ABSTRACT

Constructed Response items are open ended, short answer questions that measure the application level of cognitive skill and content knowledge. Although constructed response items can provide a lot of students' information, the high cost required in manually grading the constructed responses.

The aim of this study is to develop an on-line assessment system with constructed response items in the context of elementary mathematics education. The system can record the problem solving process of constructed response items, and then it can transfer the process to response codes. An inference mechanism based on artificial intelligence is implemented in the system and it can help to diagnose the bugs in the problem solving process automatically. The test of "Multiplication of Fraction" unit in the primary school mathematics is constructed to evaluate the performance of this system. One hundred and fifty-eight sixth graders were chosen from classes of elementary schools. The mean of classification rates of the system is 97%. The results show that the proposed system can diagnose the students' bugs accurately. In addition to the diagnostic information, a high-order item response theory (HO-IRT) is applied to estimate the overall and domain abilities.

Keywords: constructed response item, computerized test, diagnostic assessment, high-order item response theory

Introduction

Constructed response (CR) items that elicit students' higher-level constructs are beneficial to evaluate complex concepts or skills such as problem solving. Students' responses are multiple problems solving process, sometimes including explaining the reasons about how to get the answer. The responses will be classified to many types, and then given the scores according to the performance. Each constructed response item has a unique rubric.

The constructed response items have been used by some large-scale assessments, such as NAEP, PISA and TIMSS (National Assessment Governing Board, 2005, Olson, Martin, & Mullis, 2008, OECD, 2005). The NAEP example items can be found on the website. (http://nces.ed.gov/nationsreportcard/itmrl sx/search.aspx?subject=mathematics). The scoring method scored the responses with its completeness into five scores, extended/satisfactory/partial/

minimal/incorrect, and each level has clearly descriptions. The scorers must be trained to make sure the response can be scored consistently, and the training processes are costly and time-consuming. Although constructed response items provide a lot of information, the high cost required in manually grading the constructed responses.

Furthermore, there are some computerized tests with automated scoring system like Figure 1 as an example. The variations in items are limited to the complex scoring method, and also cannot record the problem solving process. The aim of this study is to develop an on-line assessment system with constructed response items. The system records the constructed response item responses completely and analysis the learning bugs (error patterns) automatically. And the overall and domain abilities will be estimated simultaneous by higher-order item response theory.

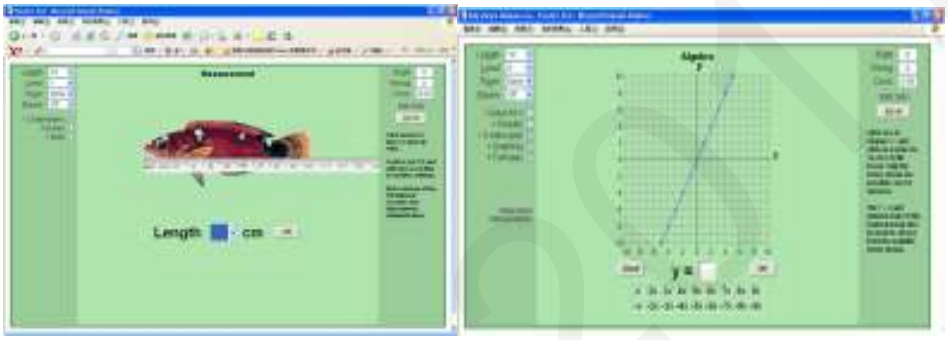

Figure 1 Computerized constructed response items

(Thatquiz, http://www.thatquiz.org/)

METHOD

Computerized Test Development

The figure 2 and figure 3 show the test interfaces of multiple choice and constructed response items, respectively. The responses, like the equations or the fractions, can be input by using the tool which the system provided adaptively for each CR items. The inputted equations will be displayed in the response area, and they will be recorded by LaTeX format. Table 1 shows an inputted equation and the corresponding codes in the database.

Figure 2 Interface of multiple choice items

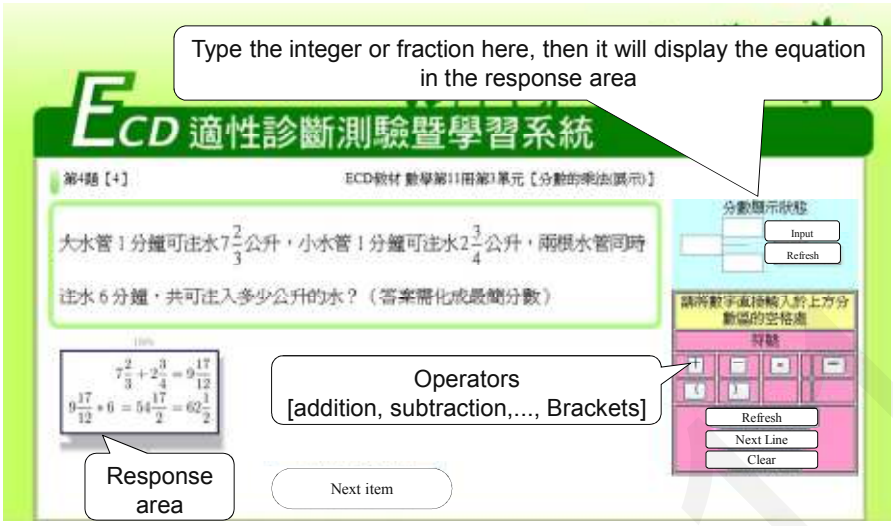

Figure 3 Interface of constructed response items

Table1 an example of the response format

Response pattern	$12\frac{8}{15}\times 1\frac{1}{4}=\frac{180}{15}\times\frac{5}{4}=\frac{45}{3}=15$
Database	12\\frac{8}{15}* 1\\frac{1}{4} = \\frac{180}{15}* \\frac{5}{4} = \\frac{45}{3} = 15\\frac{}{}

The analysis of constructed response item

One of the purposes of this study is to develop an automatic analysis process for CR items, which allows the diagnosis of error patterns. There are two parts in the analysis process; first, some rules are used to build a decision tree and to classify the responses into several types. Second, the prototypes of error patterns will be compared to responses of the participants by using the block-based matching analysis.

For example, in item 27, three rules are involved in the decision tree (see Figure 4)

Rule 1: check the status of the response area. If the response area is blank, then code 99 will be given,, otherwise, rule 2 will be applied

Rule 2: examine the appropriateness of the first equation in the participant's response by comparing with the correct equations preset in the system. If the first equation is correct, then apply to Rule 3a; otherwise apply to Rule 3b

Rule 3a: check the correctness of the final answer. If the student's final answer is correct, then the system will record the correct answer of the student; otherwise the block-based matching is applied to the best fit error pattern from the prototypes of Bug1 to Bug9.

Rule 3b: if the error is occurred due to fraction addition instead of fraction multiplication, the block-based matching will refer to the best fit error pattern, the prototypes of Bug10 and Bug11. Otherwise, this implies that the student did not understand the problem, and then the system will refer to

Bug 12.

The first step of block-based matching analysis is to decompose the student's response into blocks without operators, then compare these blocks with bugs' prototypes and find the best fit error patterns.

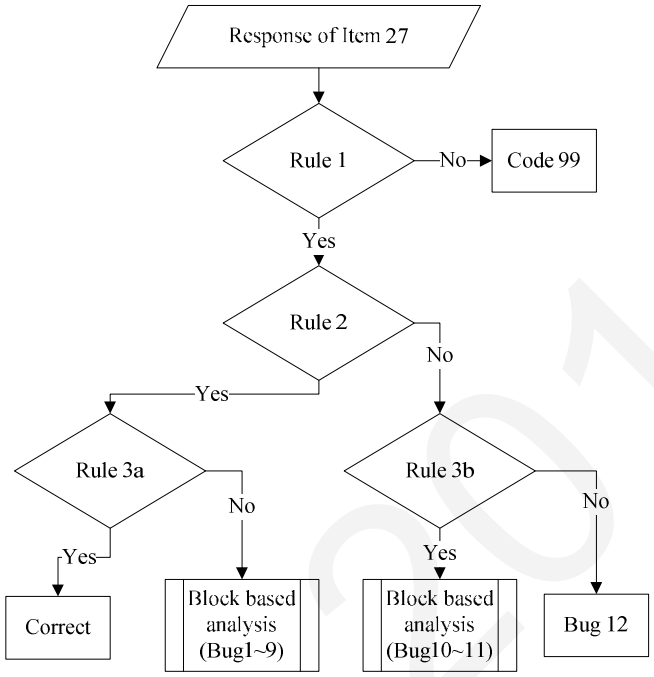

Figure 4 Analysis flow chart of item 27

Higher-Order Item Response Theory

A hierarchical structure of the higher-order item response theory (HO-IRT) framework involves he overall ability on the top and multiple domain abilities at the lower levels. This framework has been well adopted at large-scale assessment settings. de la Torre and Song（2009）estimate the overall and multiple domain abilities and their correlations simultaneously using the Markov chain Monte Carlo (MCMC) methods in a hierarchical Bayesian framework. Each domain is considered to be unidimensional, and a domain-specific ability $\theta_i^{(D)}$ accounts for the performance of examinee i on domain d, where $d = 1, 2, ..., D$. The correlations between the different domain abilities are accounted for by positing a higher-order overall ability θ_i. Specifically, the domain abilities are linked to the overall ability via the linear function $\theta_i^{(d)} = \lambda^{(d)}\theta_i + \varepsilon_{id}$, where the $\lambda^{(d)}$ is the latent regression coefficient of the domain ability d on the overall ability, and ε_{id} is the error term which follows a standard normal distribution.

In the present study (as shown in figure 5), the mathematical ability (overall ability) was assessed by the three domain abilities, in which conceptual knowledge was measured by MC item 1-4, procedural knowledge was measured by MC item 5-14, and problem solving was measured by MC 15-26 & CR 27-30.the test measured the mathematical ability and three domain abilities, conceptual knowledge, procedural knowledge and problem solving.

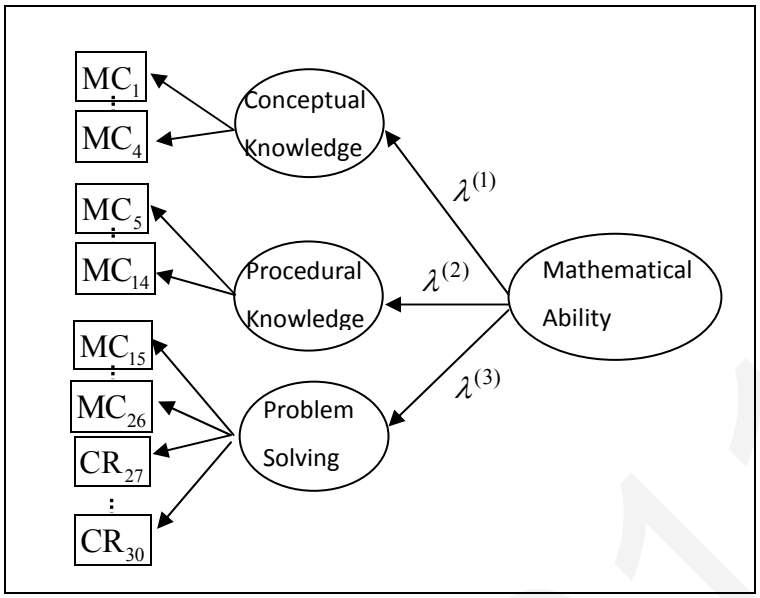

Figure 5 assessment framework of HIRT

Participants

A test of "Multiplication of Fraction" was developed based on the mathematics curriculum in Taiwan. One hundred and fifty-eight six graders were recruited from 4 elementary schools in Taiwan. There are 30 items in the test, including 26 multiple choice (MC) items and 4 constructed response (CR) items.

RESULTS

The effectiveness of the error pattern diagnosis was examined by comparing the automated scoring results of the system to the expert scoring results. Table 2 shows the percentage of correctly identified error patterns by the system and human (classification rates). The classification rates of constructed response items ranged from 94.94% to 99.37%, which means that the system diagnosed student's error patterns as effective as human raters.

Table 2 Classification rates of learning bugs

CR items	Classification rates	# of learning bugs
27	99.37%	12
28	98.73%	11
29	94.94%	10
30	95.57%	9

Table 3 shows the estimated results by using the MCMC method. This result shows that the three domain abilities and the overall mathematics abilities were highly correlated.

Table 3 The regression coefficient of the domain abilities

variable	$\lambda^{(CK)}$	$\lambda^{(PK)}$	$\lambda^{(PS)}$
Mean of posterior	0.947	0.948	0.979

Table 4 shows the correlations between the abilities and the number of learning bugs. The number of error patters were highly correlated with the overall mathematics ability (r = -0.901), whereas the correlations between the number of error patterns ranged from r =-0.896 to -0.907. The results show that the more error patterns the student had, the lower the mathematic ability was. Therefore, the results provide evidence that the proposed system successfully and effectively identify students' error patterns.

Table 4 Correlations between the abilities and the number of bugs

	Domain			
Variable	MA	CK	PK	PS
The number of Bugs	-0.901	-0.896	-0.907	-0.898

Note: MA= Mathematical Ability; CK= Conceptual Knowledge; PK=Procedural Knowledge; PS=Problem Solving.

CONCLUSION

The present study developed an on-line assessment system with constructed response items. The results show that the current system effectively and efficiently identifies student's error patterns. Moreover, the utility of the system in the real class settings is observed.

Although the CR items provided more information than MC items in the system, answering a CR item cost much more time than MC item's. This was caused the proficiency of the system, although we had training lesson before the test. Maybe the computer skills can be considered in the experiment.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the support of this study by the National Science Council of Taiwan, under the Grant No. NSC 99-2410-H-142-008-MY3.

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A MULTI CRITERIA DECISION MAKING METHOD FOR THE E-CERTIFICATE PROGRAM SELECTION

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Abstract

The variety of open and distance learning (ODL) programs contributes to the personal development of learners. Today, different institutions around the world offer different ODL programs. E-certificate programs are one of these ODL programs that help lifelong learners to enhance their personal and career development. At this point, which institution and/or program to choose is becoming an important decision problem for the learners. In this study, the analytic network process (ANP) which is a multi criteria decision making methodology is used to help learners to choose an appropriate e-certificate program. Discussing a decision problem with its both tangible and intangible and also interdependent criteria simultaneously is the advantage of the ANP. The ANP model established here, examines the ODL e-certificate system structure with its criteria in detail. In addition, it offers a structure that may help institutions in determining their educational policies.

Keywords: Analytic Network Process, Lifelong learning, Multi criteria decision making, Open and distance learning, e-certificate

1. INTRODUCTION

In recent years, the variety of open and distance learning (ODL) systems has been increasing around the world. These systems may have the programs based on high school diploma, bachelor's degree, master degree, doctorate diploma, and/or e-certificate programs. Today's competitive environment increases the importance of certificate programs day by day. Individuals updated their knowledge and skills by completing certificate programs. A certificate helps lifelong learners to plan a career in line with their interests. People in very different age and occupational profiles can participate to certificate programs. Therefore, the e-certificate programs suited for this learner profile.

After making the decision to participate in an e-certificate program, the learner selects an appropriate e-certificate program that suits for his/her expectations. There're different criteria affecting this selection. From this point, selecting an ODL certificate program becomes a multi criteria decision making problem.

We faced with various MCDM problems in every day like school selection, portfolio optimization, supplier selection, which course to register, which house to buy, and so on. In MCDM theory the general assumption is to assume that the criteria are independent. This makes optimal MCDM solutions less useful than they could be and a decision maker who accepts an optimal solution from the model cannot be sure that he has made the correct tradeoffs among the objectives. In the literature it is widely recognized that in many decisional problems criteria are interdependent (Öztürk, 2006). And also the weights of the criteria and the priorities of the alternatives change from person to person. At this point, the MCDM methodologies of the Analytic Hierarchy Process (AHP) and the Analytic Network Process (ANP) are come into prominence with their properties of evaluating conflicting criteria also with a group of decision makers at the same time.

According to Ertugrul and Karakasoglu (2007), in future studies multi criteria methods like AHP can be applied to multi criteria decision problems of the universities. There are some related studies that use MCDM techniques for distance and open education problems in the literature. Poonikom et al. (2004) has proposed a systematic framework using ANP for the selection of universities that offer undergraduate program in engineering. Chao and Chen (2009) propose an AHP model to weight the factors in an e-learning program or system and then evaluate the overall e-learning effectiveness. Sadi-Nezhad et al. (2010) evaluate three e-learning systems in Iran by using ANP and fuzzy preference programming. Girginer et al. (2007) developed an ANP model to select a courseware development platform for distance education systems. Ozkul et al. (2007) developed an AHP model to evaluate distance education implementation models. Shee and Wang (2008), proposed an adjusted AHP from the perspective of learner satisfaction to support evaluation-based activities taking place at the pre- and post-adoption phases

of the web-based e-learning system (WELS) life cycle. Zhao and Shao (2010) discussed the application of ANP in evaluating assets management of the institution of higher education through establishing evaluation index system and confirming the weight of every index. Chen and Chen (2010) have combined DEMATEL, fuzzy ANP and TOPSIS approaches to develop an innovation support system. Lesmes et al. (2009) applied ANP to establish weights in order to re-accredit a program of a university. Wang and Hsu (2010) proposed twenty-five criteria to assess the quality of e-learning by The AHP.

Depending on the today's technology and information oriented age individuals try to enhance their personal and career development. Based on this concept of lifelong learning, some ODL institutions offer different types of e-certificate programs. These programs are the alternatives of this study. The purpose of this paper is twofold. The primary objective is to develop an ANP model to determine the criteria of the ODL systems based on e-certificate programs and to determine weights of the alternative programs. Secondly, this paper identifies and structures a framework to evaluate and/or to develop an open and distance institution's education strategy. With this framework institutions can review their open and distance programs.

The paper is organized as follows. In Section 2 firstly, the Analytic Network Process (ANP) approach is briefly summarized. Then in Section 3, the ANP model is developed and according to the model a group of learners make comparisons to select the appropriate program. Finally, the conclusions are discussed in Section 4.

2. METHODOLOGY: ANALYTICAL NETWORK PROCESS (ANP)

In decision making in particular and life in general, one cannot rely on any one thing exclusively. All things -judgment, experience, reasoning, logic intuition- are fallible at times. It is therefore necessary to make use of a structure within which one sort through, and give relative weights to relationships, values, and the strength and direction of those relationships (Saaty, 2001). A person may not be schooled in the use of numbers but still have feelings and understanding that enable him or her to make accurate comparisons. Such judgments can be applied successfully to compare stimuli that are not to disparate in magnitude. The Analytic Hierarchy Process (AHP) provides us with the way to derive from observer's quantified judgments, a set of weights or priorities to be associated with individual stimuli (Sağır Özdemir, 2003). The AHP is a theory that depends on the values and judgments of individuals and groups. It is used to derive ratio scales from both discrete and continuous pairwise comparisons in multilevel hierarchic structures.

In most real life problems, not only does the importance of the criteria determine the importance of the alternatives as in a hierarchy, but also the importance of the alternatives themselves determines the importance of the criteria. Therefore, the Analytical Network Process (ANP) was developed as generalization of the AHP. The ANP model structure becomes a network substituted for hierarchy in the AHP. The ANP is a theory of measurement generally applied to the dominance of influence among several alternatives with respect to an attribute or a criterion. ANP is also applied to evaluate the dominance of criteria with respect to a higher criterion and it is applied to evaluate alternatives with respect to a governing criterion (Saaty, 1996).

The ANP is the first mathematical theory that makes it possible for us to deal systematically with all kinds of dependence and feedback. The reason for its success is the way it elicits judgments and uses measurement to derive ratio scales (Saaty, 2002). This fundamental scale of absolute values for representing the strength of judgments is from 1 to 9.

The process of ANP comprises four major steps (Meade & Sarkis, 1999; Saaty, 1996). In the first step, the problem should be stated clearly and decomposed into a rational system like a network. The structure can be obtained by the opinion of decision makers through brainstorming or other appropriate methods. The pairwise comparisons are done then and the priority vectors are obtained in the second step. Decision elements at each cluster are compared pairwise with respect to their importance towards their control criterion, and the clusters themselves are also compared pairwise with respect to their contribution to the goal. Pairwise comparison is made in the framework of a matrix, and a local priority vector can be derived as an estimate of relative importance associated with the elements (or clusters) being compared by solving the related equations.

In the third step, the *Supermatrix* is formed. To obtain global priorities in a system with interdependent influences, the local priority vectors are entered in the appropriate columns of a matrix, known as a supermatrix. The supermatrix is raised to limiting powers to calculate the overall priorities, and thus the cumulative influence of each element on every other element with which it interacts is obtained (Saaty & Vargas, 1998). Finally in the fourth step, the best alternative is selected. If the supermatrix formed in Step

3 covers the whole network, the priority weights of alternatives can be found in the column of alternatives in the normalized supermatrix. On the other hand, if a supermatrix only comprises of components that are interrelated, additional calculation must be made to obtain the overall priorities of the alternatives. The alternative with the largest overall priority should be the one selected.

3. THE ANP MODEL OF THE PROGRAM SELECTION PROBLEM

In a selection problem, there may be both tangible and intangible criteria. In the study, the determined criteria are the criteria that also affecting the ODL systems. In an attempt to provide a pedagogical foundation as a prerequisite for successful e-learning implementation, there are some studies like Govindasamy (2002) and Ong et al. (2004) that discussed the e-learning critical success factors. Here, the ANP model is constructed to analyze an ODL system and the critic factors affecting the system are determined. By the constructed model, the programs can be evaluated and also the relative priorities of them will be obtained.

3-1. Definition of Main and Sub-criteria

The proposed ANP model is applied to fourty lifelong learners. Here, the alternative five e-certificate programs are selected from the e-certificate programs of Anadolu University. They are listed in alternatives cluster as: (1) Marketing, (2) Entrepreneurship, (3) Business Administration, (4) Management and Organization, and (5) Financial Management.

After the literature review and experts' opinions, the main criteria that must be considered are determined as *learning media*, *evaluation*, *support services*, *learner*, *instructor*, *administration*, and *alternatives*. Each criterion has some sub-criteria that also affect the system and the alternatives. All criteria and their sub-criteria are briefly explained as follows:

Learning media: The learning media has to provide efficient and effective learning environment. So, the program's various learning media types becomes one of the important issue at the program selection stage. The learning media sub criteria are defined as follows: (1) e-book, (2) e-television, (3) e-practice, (4) e-exam, (5) e-audio book, and (6) e-facilitator.

Evaluation: The following evaluation types can be used with different ratios in an ODL system: (1) E-portfolio, (2) Paper based examination, (3) Online examination.

Support services: Although the importance of time and space independency feature of open and distance systems, physical facilities have also a substantial role along side of e-support services. Based on these issues the sub criteria are determined as follows: (1) Local centers (2) Regional centers, (3) Computer and technology centers, and (4) e-support.

Learner: In the field of learner, the open and distance program is directly related to some learners' properties. Besides these criteria interaction between the learners and learning platforms and/or instructors is also affecting the learners' success. So, the learner criterion has two main criteria as interaction and properties. The related platform must include the components that satisfy the interaction of the learners. Also, some online courses have one or more prerequisite requirements. The sub criteria related to the learner are defined as (1) Working status (2) Academic background, (3) Age distribution, (4) Facility usage, (5) Cover the expectations, and (6) Interaction.

Instructor: Considering the instructional activities, the sub criteria of instructors are determined as: (1) Instructional designing, (2) Response time, and (3) Know how.

Administration: ODL systems refer to the use of technology intensively. So, it's crucial for administrators to keep pace with the technology. Beside the technological issues, the prestige of the institutions plays an important role in the selection phase. Another issue is about the validity. The validity of a certificate may be called into question by potential employers if it is not received from an accredited educational institute. Finally, number of learners gives some hints about the programs. Therefore, the sub criteria related to administration are given as follows: (1) Validity, (2) Prestige, (3) Technology, (4) Number of graduates, (5) Student fee, and (6) Educational policy.

When the definition of the main and sub criteria is completed all connections among them are determined. In Figure 1, the model structure constructed in Super Decisions software is given. In the figure, an example is given when the mode to examine the connections is selected for *interaction* in the *Learner* cluster. The elements framed in bold color in other clusters are those defined as the influencers of the selected criterion. The arcs between the clusters indicate the outer dependence of elements in one cluster on the elements in an another clusterwith respect to a common property. Also the loop in a cluster indicates an inner dependence of the elements in that cluster.

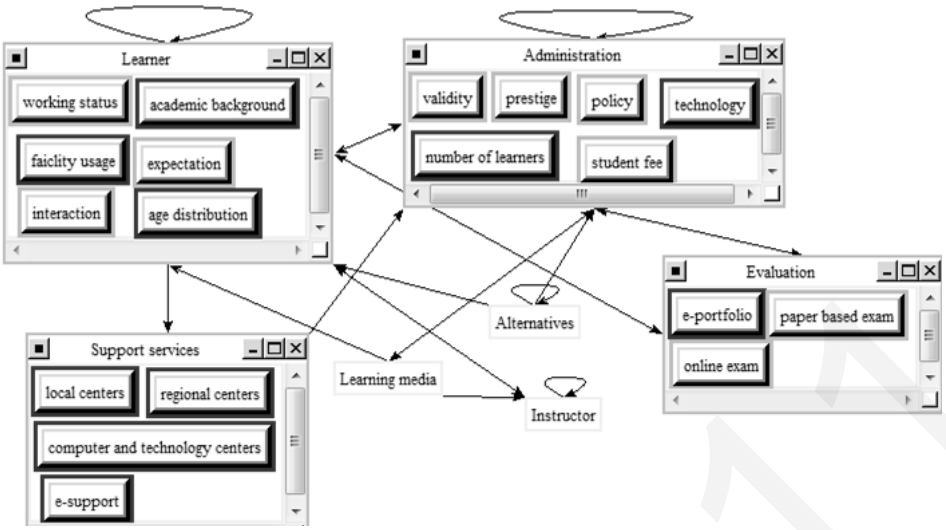

Figure 1. The ANP model

3-2. Pairwise Comparisons

To set the priorities among the five alternative e-certificate programs, the pairwise comparisons are performed by entering judgments including all clusters and nodes. The estimated weight of each criterion and alternative programs are obtained in the Super Decisions environment. The evaluation is carried out by a group of 40 senior class industrial engineering students and industrial engineers from different working areas (banks, hospital, industry and tourism). The learners made the pairwise comparisons and these comparisons are converted to the local weights. Finally, the judgments of each learner are synthesized using the geometric mean approach.

Pairwise comparisons for the nodes in each cluster—that belong to a parent node—are carried out for all the parent nodes in the model. In the comparisons firstly the criteria are compared with respect to each alternative. Here, two types of questions are asked: (1) Which of the alternatives satisfies a criterion more? (2) Which of the two criteria is more characteristic of a given alternative? The preference levels for the criteria change from one learner to another. Naturally, if a criterion is more *desirable* or *positively affects* the learner, it will take a higher weight. Also, the clusters that have any links to their elements from the elements in a given cluster must be compared for their impact on the given cluster.

As an example for the comparisons Figure 2 gives a screen view of the pairwise comparisons of clusters. For the given cluster "Learning media", it's asked that *which of the two clusters has more effect on e-certificate programs, and how much more*? And the first answer is given as *Administration* is 3 times much more affecting the cluster than *Instructor*.

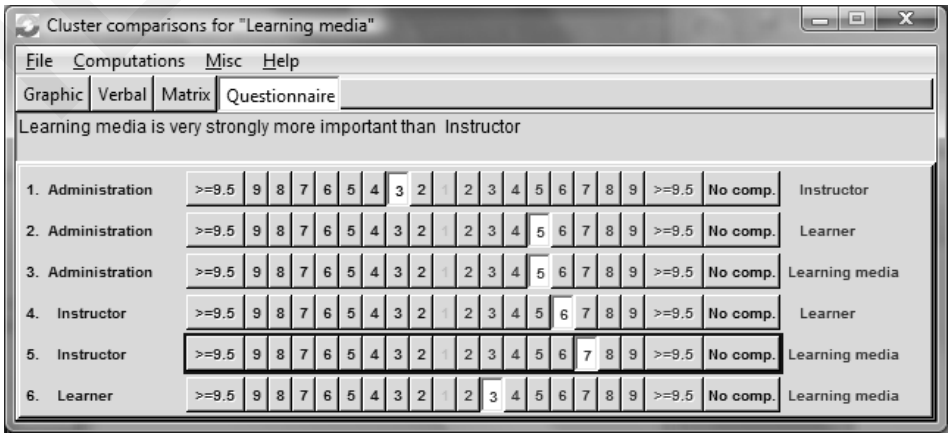

Figure 2. Pairwise comparisons of clusters

3-3. Numerical Results

According to the consistency calculations, all pairwise comparisons are consistent in this study. The learners determined the educational *policy* imported by the administration as the most influential decision criteria in the ODL system e-certificate program selection process. Table 1 lists the priorities from the limit matrix. The most important criterion for each cluster is written in bold. For the support services, local, regional and technology centers have no weights. The learners give the all importance to the e-support services. On the learning media side, the e-facilitator has a greater weight than the other media.

Table 1. Relative weights of the criteria

Cluster	Element	Priority
Instructor	Instructional designing	0,00913
	Know how	0,01364
	Response time	**0,01852**
Learner	**academic background**	**0,10071**
	age distribution	0,03206
	facility usage	0,03165
	interaction	0,01842
	expectation	0,05092
	working status	0,08217
Learning Media	e-book	0,00700
	e-television	0,00539
	e-practice	0,01609
	e-exam	0,00882
	e-audio book	0,00271
	e-facilitator	**0,01782**
Administration	number of graduates	0,02643
	prestige	0,02376
	student fee	0,16470
	technology	0,07805
	validity	0,14345
	policy	**0,19611**
Support services	**e-support**	**0,00582**
	local centers	0,00000
	regional centers	0,00000
	computer and technology centers	0,00000
Evaluation	e-portfolio	0,00727
	online examination	**0,00823**
	paper based examination	0,00245

The priorities of the alternatives are given in the second column of Table 2. According to the decision model, the *Business Administration* is selected as the most appropriate ODL e-certificate program. As mentioned before, these results are given by a group. The weights are changing from one learner to another. For instance, according to 7 learners Marketing is selected as the most appropriate program while Entrepreneurship is the best for 6 learners.

Table 2. Overall outcome

Alternatives	Limiting	Normalized priority (normalized by cluster)	Rank
Business administration	0,018242	0,237245	1
Financial management	0,017413	0,226465	2
Entrepreneurship	0,015748	0,204815	3
Marketing	0,014994	0,19426	4
Management and organization	0,01055	0,137215	5

4. CONCLUSION

This study employs a MCDM approach to select an appropriate e-certificate program for lifelong learners. In a selection process, it's crucial to reflect the interdependencies between the criteria and alternatives. The ANP is the first mathematical theory that makes it possible for us to deal systematically with all kinds of dependence and feedback. This paper applies group decision making to determine the interdependencies. Because of the fact that the degree of importance is varied according to decision maker, group discussion is more reflects the realities.

The proposed decision framework has identified and weighted ODL systems' criteria and alternative e-certificate programs. All the defined criteria are significant but the learners also prioritize the criteria according to their judgments. Based on these judgments beside the selection process, the criteria weights may be a guide to institutions to determine an educational policy like widening access to the learning media.

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A MULTI-DIMENSIONAL STRATEGY FOR KNOWLEDGE AND SKILL BUILDING IN A LARGE IT ENVIRONMENT

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ABSTRACT

Large, multinational IT organizations with complex business processes have multi-dimensional, complex learning and knowledge requirements, which cannot be fulfilled via conventional training techniques. There is need to innovate and streamline training processes using technology tools, more so as learning needs are very dynamic in an IT firm and depend a great deal on industry environment and client dictates. This paper delves into various technology and process innovations which bred success in Tata Consultancy Services Ltd. (TCS), Asia's largest IT services company with more than 200,000 employees across 42 countries worldwide. TCS has applied and integrated learning and knowledge management technologies including learning management systems, e-learning and open platforms to deliver a seamless skill building experience, given its wide scope of operations.

Key words: Knowledge Management, Skill Building, Technology Tools

INTRODUCTION

In the new corporate world order, the "haves" and "have nots" are increasingly being differentiated in terms of their knowledge and skills. Those with the requisite knowledge and skills being demanded by customers can hope to survive and flourish. This is essential for the following reasons:

- Understanding the changing environments
- Understanding the new linkages and relationships that define the environment
- Getting the skills necessary to operate in relation with the company and also in relation with clients
- Gathering the inputs required to step up the ladder in a changed environment
- Getting the requisite inputs to compete and define goals that suit

The scenario is even more complex in a large IT organization due to multiple learning and skill requirements. An IT organization need just not focus on developing the required IT knowledge to sustain its operations but also client sector knowledge. Learning in such environment is a continuous process as conditions keep evolving – this would mean perhaps a lifelong learning process. Companies know that investment in learning is a must if they are to meet their goals. According to an old, yet highly relevant article in the New York Times (2002):

> "Shares of companies that spend the most on employee training and development outperform those that spend the least, a study found. …a company's success depends greatly on the collective skills of its employees—its human capital. Companies that invest more in developing that capital should fare better."

The article also says that companies that were in the top 20% of training and development expenditure outperformed the stock market by an average 16.2% between 1997 to 2001. Hence the company's bottom line is directly affected by investment in education.

NATURE OF OPERATIONS IN AN IT FIRM

If we look at IT companies specifically, the range of services they offer clients is huge across services, outsourcing and consulting serving several industry verticals. Some of these include Banking and Financial Services, Healthcare, Manufacturing, Transportation, Government. Client-orientation is a driving force in IT companies and it's the key for business growth. For an employee in the sector, IT learning is a constant need as it's the core for their job and there is need to be updated on new versions and acquiring new technical skills. However, employees also need to have the requisite business skills and the client business domain knowledge.

Importance of Business Domain Knowledge

Client surveys have revealed for most IT companies that they fare well in terms of technology but lack where business knowledge is concerned. An IT project can take several forms – software development, a new solution, updation of an existing solution and even maintenance. To be able to do this, IT employees need to have an intimate understanding of the client business, processes and interactions, without which project delivery may be jeopardized. In fact, several projects fail mainly due to lack of understanding of client business and needs.

Hence, even before they award projects, clients are seeking proof of training programs in their business area and testimonials to the effect. In addition, IT companies want a big pool of skilled consultants who would help them in identifying new opportunities, innovative with existing solutions and help develop new solutions - all towards gaining a competitive edge and gaining market stronghold.

Therefore, multiple kinds of training are required, which is very challenging in an IT environment, as the focus is not just full time learning. Employees are expected to devote their full working hours to the project and also apply their minds to the underlying technologies, business skills and the business domain of client. This kind of a scenario requires multi-tasking and a high level of "juggling" skills. Interestingly, by the time an employee learns all this and applies to a specific business domain, it's time for a change.

CHALLENGES FOR A LEARNING STRATEGY

Typically, growth of an employee in an IT firm depends on capabilities in multiple skills, projects and domains. Hence, people prefer to move internally among various projects every two to three years, as this also prevents monotony and saturation. This has a lot of significance to the corporate knowledge and learning strategy:

- Firstly, the need to capture the knowledge of people leaving a project, both explicit and implicit
- Secondly, the need to impart skills and business domain knowledge for the new project

The task is monumental, as this kind of learning and relearning occurs every couple of years for thousands of employees. In addition to this, the organization has to factor in new joinees who need to be sensitized to organizational culture plus also made "employable".

As per the Confederation of Indian Industry and the Boston Consulting Group, India would face a "talent gap" of more than 5 million by 2012, as existing educational institutions do not impart employable skills. Just 20% of the engineering graduates are employable. A McKinsey report finds only 25% engineers, 15% finance graduates and less than 10% of the other graduates to be employable.

Thus, new joinees fresh out of engineering colleges need a separate learning process, aiming to make them "project" resources. This means training them on the technologies employed by the company at client sites, systems used internally and the basic etiquette and soft skills. To complicate this further, these people are geographically dispersed in varying time zones.

TECHNOLOGY FOR MEETING THE CHALLENGES

Traditional learning techniques such as the classroom setting may not suffice. The tried and tested method of classroom environment would have to make way for a new strategy. Technology, in the form of web-

based learning and knowledge/competency management systems would have to be used in an innovative, user-friendly manner. This would have multiple benefits to support a multi-dimensional learning strategy:

Apart from the obvious capabilities of global reach, technology and e-learning systems offer a number of other advantages:

- Ability to scale up capacity
- A modular approach for adding new programs
- Easy report generation possibilities
- Manpower rationalisation
- Operational efficiency
- Option for access control
- Ease of database creation and maintenance
- Feedback mechanisms and discussion capabilities

The interaction facilitated by e-learning systems would help improve a learning/knowledge department's offerings and create programs that meet account requirements. Further to an e-learning system, an organization requires a knowledge management solution that can map an employee's knowledge when he/she leaves a project. This should help others in the project. And an efficient e-learning system needs to integrate with this knowledge management solution, thus creating a "one-stop" learning environment.

THE LEARNING SYSTEM AT TCS

Tata Consultancy Services Ltd. (TCS) is one Asia's largest IT services company, with close to 200,000 employees spread across 42 countries worldwide. TCS is ranked 6th in FinTech 100, which is an annual ranking of technology services providers to the financial sector. TCS is the highest ranked Indian IT firm on this annual list. TCS has been listed in Forbes' sixth annual 'Asia's Fabulous 50 companies'. This is the third time TCS has featured in this list. TCS was also the winner of the 'Golden Peacock Innovation Management Award for the year 2011' for innovative culture in a learning organization.

As one of the global IT leaders, Tata Consultancy Services (TCS) has always been traditionally strong in the area of employee training. There are a number of initiatives at the organizational level as well as at the practice level to ensure there is comprehensive learning culture. Particularly, as TCS has a young workforce with average age of 27 years and keeping them interested and honing their skills is a real task. There is an exclusive unit devoted to learning, which designs, develops and deploys training programs on a regular basis, often in a classroom setting.

All the learning programs are mapped to competencies and address learning needs at different proficiency levels. To help in this, TCS has implemented a competency management system which helps associates and their leaders to plan the learning and hence career progression of the associates. The competency management system looks at an employee's current competencies and suggests a learning path for the employee to scale up to. The learning path suggests various training programs both web-based as well as instructor led. The employee can add such programs to learning calendar and on completion, his/her competency gap is closed and the system reflects the new skills of the employee. An employee can also search for various programs being offered based on his or her own interest.

In addition, there is a knowledge repository portal which pools all information, articles, papers and learning assets. This helps an employee grasp the required information in a short span of time. Specifically, it is important when an employee wants to know what is going on in a project. Also the system has the capability to record all project related information in terms of client presentations, project resources, data and technical documentation and training material.

The focus of these systems has in the past, been technical domain…however, there was a lack of uniform, standardized approach for delivering business domain training. Hence, Financial Technology Centre (FTC) came into being in July 2005 piloting for the banking and financial services sector as a precursor for TCS Business Domain Academy ("Academy"). Academy would serve all the industries TCS was active in. Given the typical environment in the large company, FTC decided to adopt e-learning practice to deploy planned training programs. FTC created a pilot banking and finance certificate program, which had extensive learning material as chapters and exams at the end of each chapter and a final exam. On passing

these exams, the candidate would be given a certificate. The intake of this program was beyond expectations and FTC soon followed up with several more BFS programs.

All these programs filled a huge gap in learning programs as external parties were unable to meet the company specific requirements. More so, as FTC was willing to develop specific customized programs on demand. In addition, these programs were TCS IPR assets and free of cost to the employees. This was particularly attractive to other industry units including all the non-BFS ones. They started demanding extension of FTC programs to other business domains as well. Hence, in 2008 the TCS Business Domain Academy ("The Academy") was born.

Following are counted among the Academy's unique selling propositions (USPs):

- A central location for business domain training
- A supplement to projects and the Learning and Development team
- Initiatives to "Train the Trainer" leading to Multiplier effect
- A dedicated team built to meet domain demands of our associates and projects
- A centre that can be tapped for pre-sales activity
- Expertise used in RFP responses and consulting assignments
- A unit that has proven to be invaluable in meeting specific customer demand
- Called upon to develop special learning programs which may not be available externally or internally
- Unique certification strategy complete with exams and soft copy certificate
- Innovative program delivery methods including Videoconferencing, Digitization, etc
- Auto generation of e-certificates for successful associates

The greatest contribution of the Academy has been in creation in a large volume of Copyrighted assets, which are upgraded annually in July to reflect the changing trends and business conditions. The Academy initiatives can be clubbed in the main categories of: Online Certification Programs; Customized Training Programs; Portal Management and Innovation; Research Activities, Pre-Sales Activities, Consulting and Content Development.

The Technology Platform

There are several e-learning systems worldwide – proprietary as well as open source. In a large environment, open source platforms would be ideal, as there is scope for large number of additions as also customizations. In addition, the learning system managers can learn from experiences of large number of such administrators and system professionals worldwide.

There are several open source platforms available for e-learning, of which the ones often used and in demand are – Moodle and Sakai.

Internally, the Academy implemented *Modular Object-Oriented Dynamic Learning Environment* (MOODLE) as the core Learning Management System (LMS). The original software platform did not have some features required as per the Academy requirements, so the technical team customized the platform, as follows:

1. Registration page:
    a. introduced CAPTCHA (**C**ompletely **A**utomated **P**ublic **T**uring test to tell **C**omputers and **H**umans **A**part)
    b. Email restricted only to TCS email id
    c. Password according to TCS policy
2. Restriction on changing email ID field – enabled only form the e-learning technical administrator
3. Customized appearance of academy e-learning portal to reflect company logo and tag.
4. Enforcing certain courses as pre-requisites as per the Academy learning management system policy.
5. Systematic Course navigation – Academy certification programs comprise chapters grouped into modules, and module wise quizzes. The quizzes need to be completed in a sequential order and

cannot be attempted until a module has been completed. There should be a minimum time gap of 12 hrs between the quiz attempts. The final quiz can be given after 7 days from the date of enrollment.

6. Quiz evaluation - Negative marking was introduced for each wrong answer.
7. Enforcing the feedback survey after course completion and on completion of the survey only certificate would be generated.
8. On successful completion of feedback survey, associate gets an automatically generated certification on the site itself listing the course name as well as the grade obtained.
9. Participants who completes the course gets certified and the certificates are sent to them automatically. We have customized the template of the certificate.
10. Report generation: A utility to pull the records of the participants and reports can be generated individually for participants, courses, categories, verticals periodically.
11. Unenrolment: Course completion is set for 90 days and after this time the participant gets unenrolled from the course automatically.

The Moodle platform has been serving the purpose of Academy excellently, and the technical team has been able to make notable contributions. These are being shared with global learning community.

Integration of the Knowledge and Learning Systems

TCS undertook a three tiered technology strategy for proper integration of knowledge and learning. It employed three systems the competency and proficiency mapping tool, the knowledge management system, and Business Domain system. All the three systems are integrated, so that TCS can have a ready pool of skilled employees, who can be easily tracked, monitored and put into suitable roles. The Academy builds the base level business skills and knowledge through various tools such as e-learning, and integrated learning using the web-audio-video systems in sync. These skills get reflected in the competency system, which gives the learning roadmap, while creating a database of skillsets in TCS.

Often, material from the competency management system is linked to specific project repository on the KM system, so that projects can directly access the information required by them. The KM system recommends the technical learning available in the competency system. Thus, there is comprehensive integration in these two systems. The Academy is also integrated with these two systems. The KM system directly links to the Academy portal, so that employees can look up and enroll into certifications of their domain. Also, whenever an associate completes a program in Academy portal, it gets updated in the competency management system. Thus, employees are able to get the best from all the systems and gain the maximum information and knowledge.

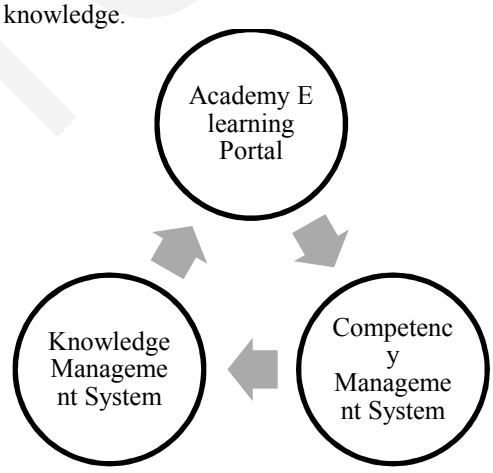

Figure 1: Integration of Systems in TCS

CONCLUSION

As has been said time and again, knowledge is indeed power. But the knowledge gained while creating this knowledge cannot be underestimated. The Academy's experience and learnings from the IT environment can be applicable to any other industry and even the academic world:

- e-learning on its own cannot guarantee success, unless it is proactive, integrated with project requirements and is user responsive.
- Some amount of blended environment is necessary – a person needs a person to voice his/her opinions to and feel appreciated.
- Learning needs commendation – only highly motivated individuals take to learning for its benefit alone. Hence, the Academy certificates make sense and also the recognition in their appraisal process.
- Challenge motivates people – the quizzes and forums challenge candidates to do better and score.
- Keep it open – learning programs do well when the candidate has an open choice. The Academy never curtails its candidates – they can pick and choose their programs and not necessarily of the domain they belong. This satisfies their curiosity for other subjects and meets their aspirational goals.
- Be responsive – Unless queries and questions are replied to, the candidates will tend to loose interest. The Academy team responds to queries either sent to them through email or discussion forums within 24 hours. Also, feedback and inputs are respected and inculcated where possible.
- Finally, standalone learning systems never work – integration across other organizational systems give them greater visibility and credibility.

Another important lesson is that most freshers or new joinees lack the requisite skills for a corporate environment. In such situation, academic linkages with the corporate sector in developing a combined virtual learning system can help address the deficiencies to a large extent. Then the new joinees can come "pre-equipped" with the skills required for the job. This option can be explored further to create a win-win situation for the universities and corporate entities.

Finally, technology enabled learning using e-learning, audio and video tools go a long way towards saving our environment. For example, as per estimates for 26,000 participants, the Academy saved a total CO2 footprint of 4115.47 tons, which would amount to 339,545 trees prevented from being axed!! This saving was taking into account travel, lodging and paper costs.

Hence, a multi-dimensional strategy that uses technology not only to attain maximum reach but also integration across systems would provide an appropriate solution to learning challenges in an IT environment. Plus, it would benefit the society on the whole with ability to link with learning communities, academia and potential employees. Finally, technology would help contribute towards the greater good of environment.

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A Preliminary Study on the Usability of Interactive AR Learning System - Conservation of Fish

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ABSTRACT

In this study, we develop an interactive AR Learning System based on Augmented Reality and interactive touch-screen. The learning content knowledge is about conservation of fish in the system. The system combines the game by the concept of AR book, AR book allow children to learn about the importance of conservation of fish, with its mechanisms to verify whether the game about AR book for their educational messages. Whole mechanism is an interactive game using touch screen to interact with the rod as a tool to get rid of the shackles of the past, keyboard and mouse, showing a more realistic interaction. According to the evaluation results that we find the interactive AR Learning System has positive usability.

INTRODUCTION

Background

The concept of conservation is popular presently in Taiwan. First, we must come to understand and learn about the basic information of fish. There are six kinds of Taiwan endemic species fish have been extinct and nine kinds of endangered Taiwan endemic species fish (Baskin, 1994; Wang, 1999). The cause of impact includes ecological changes in habitat, alien species invasion, river fish poisoning and electrocute and so on. Conservation of fish is not only their responsibility but all the people of Taiwan have the responsibility. The river conservation action must be taken from daily life.

Motivation

The technology hardware has continued to update and popularize in recent years. The Augmented Reality system development does not spend expensive equipment and cost. We develop a conservation species learning system through the AR technology. In AR, through the combination of virtual objects and real scenes, learners are able to interact with virtual fishes, getting the sense of excitement to improve their learning effect, and finally have an interesting learning.

Recently, the rivers have been serious polluted and damaged by human's illegal hunting, abandon alien species, land development without planning, and so on in Taiwan. It causes endanger of Taiwan endemic species of freshwater fish. The environmental consciousness is popular currently. People really start to

work on the conservation. However, we want to let people have a better understanding of Taiwan fish conservation issue and alert.

LITERATURE REVIEW

Augmented Reality

Augmented Reality (AR) is the extension of Virtual Reality (VR). By setting up the scene via Computer Graphics, VR can simulate objects in the real world and create the environment where users can interact with these objects. Moving one step further, AR is the images, objects or scenes generated by the computer that blend into the physical environment to strengthen our visual feelings. That is, it augments the overlaying virtual, visual representation of the physical environment on the computer by adding virtual objects to the representation. An AR environment should encompass three characteristics, namely, the combination of virtual objects and the real world, real time interaction, and 3D space only (Azuma, 1997; Azuma, et al., 2001). Presently, AR is applied very extensively to multiple domains such as education, medical technology, military training, engineering, industrial design, art, entertainment and so on (Hsieh & Lin, 2010; Hsieh, et al., 2010).

Touch Screen Technology

There are resistive touch screen, capacitive touch screen, SAW touch screen, optical touch screen, and electromagnetic digitizer. In this study, we use optical touch screen as system interactive interface. The comparison of touch screen as follows (Sears, 1991; GTouch Groovy Technology, 2011).

Resistive touch screen, capacitive touch screen: The advantages include fast response and high accuracy of recognition. But, its reflectance is higher and the material fatigue easily. Therefore, it is not long life to use. Those are shortcomings of resistive touch screen and capacitive touch screen. Capacitive touch screens are specifically designed to improve the shortcoming of low scratch resistance with resistive touch panels. Optical touch screen, SAW touch screen: It installs easily and is not affected by panel size, but it is non-linear combination of distortion. Hence, the software must calibrate and response speed is slower. SAW touch screen technology overcome the flaws inherent in capacitive touch screens. Capacitive touch screens are susceptible to interfere by signal noise and static electricity. Electromagnetic digitizer: Electromagnetic digitizer operates based on electromagnetic sensing; it involves the use of an electromagnetic pen that functions as a signal transmitter while the electromagnetic board acts as a receiver. It is stable, reliable, high-accuracy rate, low reflectivity, locating accuracy, and movement sensitivity. It belongs to linear structure of the touch panel.

System Development

Augmented reality enables users to see the real world with virtual objects superimposed upon it. In this study, we develop an Interactive Augmented Reality Learning System (IARLS). The system development

divided to hardware and software. The hardware use touch screen and the software use Virtools Dev 4.0 and 3D Max 9 to develop. The part of augmented reality of the system combined ARToolKit and Virtools to integrate. Figure 1 shows system operation flowchart.

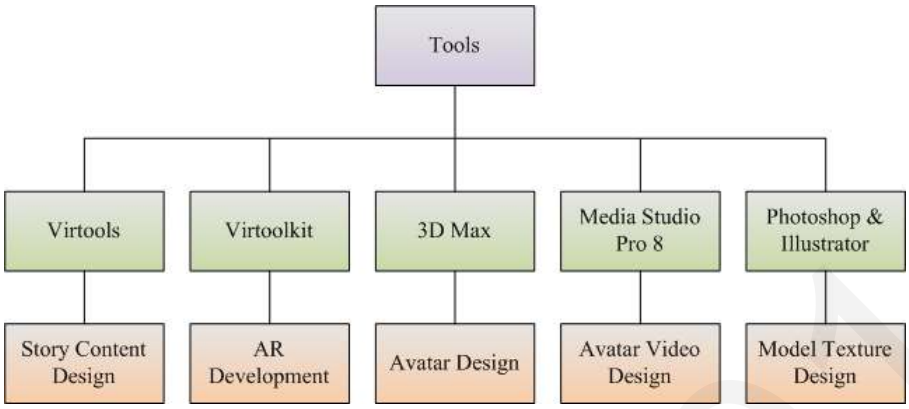

Figure 1. System development tools.

All of the avatars in the system, we design conservation of fish, alien species fish, and river pollution objects, describe as follows.

(1) Conservation of fish: We design three kinds of conservation of fish to let learner select in system of learning game. There are Oncorhynchus masou (see Figure 2), Macropodus opercularis (see Figure 3), and Varicorhinus alticorpus (see Figure 4).

(2) Alien species fish: The river brings in alien species from elsewhere is also a factor that causes to die. It includes Gambusia affinis (see Figure 5) and Oreochromis mossambica (see Figure 6).

(3) River pollution objects: The factors related to harm the fish live environment that there are discarded fish hook (see Figure 7) and garbage in system.

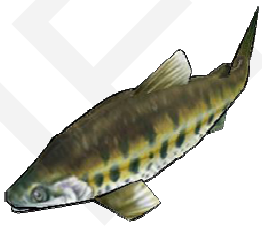

Figure 2. Oncorhynchus masou.

Figure 3. Macropodus opercularis.

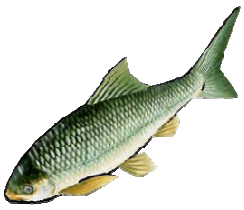

Figure 4. Varicorhinus alticorpus.

Figure 5. Gambusia affinis.

Figure 6. Oreochromis mossambica.

Figure 7. Discarded fish hook.

The system development includes five steps.

Step 1: Building avatars, objects and 3D scene. The avatars, objects and 3D scene in the system are used 3Ds Max to build.

Step 2: Drawing texture and of avatars and scene. We use Potoshop CS3 and Illustrator CS3 to draw texture of avatars and scene. Also, use it to design system surface.

Step 3: Designing video of system introduction and avatar video. The video of system introduction and avatar video are recorded by The Media Studio Pro 8.

Step 4: System coding of augmented reality. In this part we use Virtools SDK and ARToolkit as system development environment.

Step 5: Finally, we utilize Virtools as system building platform and integration.

System Operation

Learner must understand the domain knowledge of Taiwan endemic species of freshwater fish by AR Book. The teach video that superimposed upon AR Book. The system will force learner to learn. The game will start when learner learns Taiwan endemic species of freshwater fish by AR Book until last page. The game based on bonus point criterion. The 3D model objects have Taiwan endemic species of freshwater fish, alien species fish and garbage. The alien species fish and garbage could endanger Taiwan endemic species of freshwater fish. It means that the alien species fish and garbage are hazards. Consequently, learner needs to use fishing rod angling those hazards. The game will add bonus point when the learner uses fishing rod angling them. Oppositely, the game will subtract bonus point when the alien species fish and garbage endanger Taiwan endemic species of freshwater fish or learner carelessness angling Taiwan endemic species of freshwater fish. When the bonus point up to caps it represents learner successfully pass the game level. The system operation flowchart shows in Figure 8. The Figure 9 shows Taiwan endemic species of freshwater fish information sketch of AR Book and System presentation sketch shown in Figure 10.

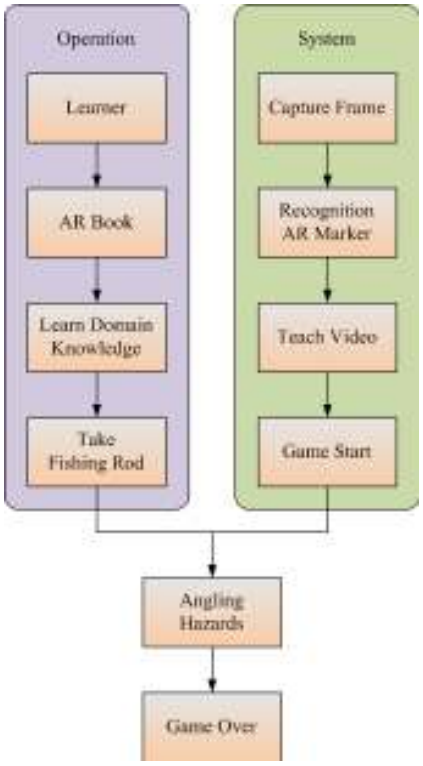

Figure 8. System operation flowchart.

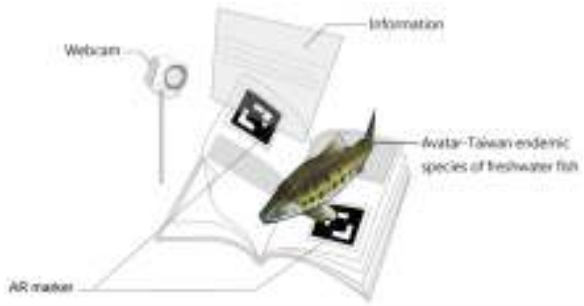

Figure 9. Taiwan endemic species of freshwater fish information sketch of AR Book.

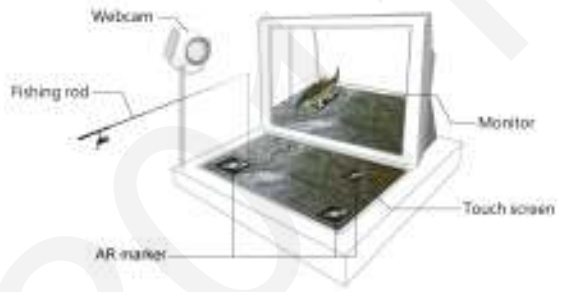

Figure 10. System presentation sketch.

The peripheral hardware of the system operation includes webcam, monitor, fishing rod, and touch screen. The webcam is capture marker of AR Book. The monitor is display game scene. The fishing rod angle hazards by learner. The touch screen shows virtual river, and there are hazards in it, the learner can interactive with it by fishing rod. There are two markers under the touch screen in order to locate avatars in the virtual river.

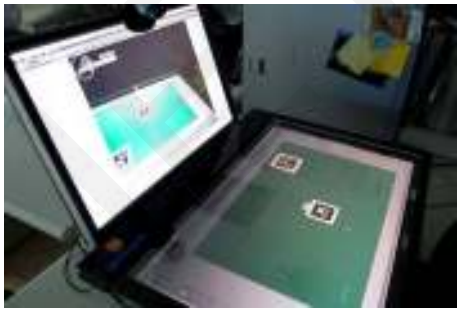

Figure 11. System presentation.

Figure 12. System operation of the subject use fishing rod.

System Evaluation

We utilize System Usability Scale (SUS) as our framework for evaluating the system usability. Subjects are 33 undergraduate students and they take information technology and e-learning courses. SUS is a questionnaire of Likert Scale to estimate users' subjective feelings of the system and further know their

degrees of satisfaction (see Table 1). In the aspect of system usability evaluation, the SUS is an efficient, time-conserving, and labor-saving way of subjective estimate. At present, it is widely applied in the system usability. After users finish answering ten questions, the scale offers a formula which transfers the subjective feelings of users into the objective data information for analysis. That is, the score of SUS is used to evaluate usability of the system. The SUS has a formula that can calculate the score for each item. The range of estimate score is from 0 to 100. The higher the score is, the more useful the system is and the more easily users can interact with it (Brooke, 1986).

Table 1: SUS questionnaire

System Usability Scale
1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to use
4. I think that I would need the support of a technical person to be able to use this system
5. I found the various functions in this system were well integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use this system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

Subjects finish operating the system and fill out the SUS questionnaire. As summarized in Table 2, the mean SUS score is 78, the median is 66, the maximum is 89 and the minimum is 57. These scores indicate that the AREVLS system is usable. We have interviews with these subjects on their ideas about IARLS after they finish operating the system and filling out the SUS questionnaire. Subjects said that this idea is very foresight. The system may be less than perfect and that is not too much learning effectiveness. Some of the learners themselves had been used relevant augmented reality system. The system could let people understand basic concept of conservation of fish in Taiwan and achieve learning by doing.

Table 2: SUS scores descriptive statistics

	N	Mean	Median	Min	Max	SD
Stat	33	78	66	57	89	11

Subjects give some comments for us that it will be able to enhance learning effectiveness for learner if the system of the fluency was more smoothly and more stable. And so, there are some reasons we must improve for system through analysis of SUS questionnaire as follows.

The system has a little bit complicated: Subjects feel that using the system has a little bit complicated procedure. Subjects who operate system need taking AR Book and look at the teach video with

superimposed upon AR Book at the same time. Then, subjects must pick up the fishing rod and operate game. It leads to a simple and interesting learning system, but the procedure is complicated.

The system somewhat difficult to use: The system is not perfect. Sometimes it cause crash occasionally during subjects operate procedure. If the system crash, it must restart and lead to the subjects learn again. For this reason, Subjects feel some trouble.

Need the assistance of technical staff: Although subjects have taken information technology and e-learning courses, only a handful of contact with augmented reality. However, there are some subjects do not know how to operate the system and marker of AR Book. As a result, most people will meet the same results when they use it. Thus, we will add the operation manual or instructions that users read it before operation system.

CONCLUSION AND FUTURE WORK

In this paper, we proposed augmented reality with an interactive touch-screen technology on learning of Taiwan endemic species fish. The system has been complete preliminary test and evaluation currently, but there are still many parts of the system to improve. In the future, we will improve the feedback of subjects and do expert evaluation of Heuristic Evaluation in system. And so, we hope to applied to exhibition after improve and expert evaluation. We find that the evaluation results show that IARLS has positive usability.

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A PROPOSAL FOR IMPLEMENTING ONLINE ASSESSMENT IN OPEN AND DISTANCE LEARNING PROGRAM

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Malaysia

Abstract

In distance learning, planning and selecting appropriate methods of online assessment is a common problem faced by most online course providers. Unlike conventional face-to-face mode, instructional designers have to be careful about the types of online assessment methods selected and the assessment distribution (percentage) allocated for the course. This paper discusses the implementation of online assessment in open and distance learning program, using blended learning mode at Asia e University Malaysia. The topics include the definitions of assessments, differences between formative and summative assessment, identifying different assessment methods practised in different schools, compare present and future online assessment methods and discuss benefits of doing online assessment. The paper ends with some suggestions and thoughts of improving and implementing the current online assessment,

INTRODUCTION

In distance learning where learners are separated from the instructor, interaction and interactivity between learner and teacher and learner and learner using online communication and collaborative tools such as email, forum, discussion board and video conferencing will enhance learning and teaching. The more interaction the learners have, the more experience they are expected to bring into their learning. According to Baath (1981), a distance learner instructor who gives more exercises in his/her learning materials or actively engage learners in learning activities may not have to prepare intensive assessment at the end of the course. The process of learning happens while doing the learning activities and taking the assessment. So a systematically design assessment perhaps would provide the opportunity for the learners to be actively engaged in learning. A study done by Meichun Lydia Wen & Chin-Chung Tsa (2006) showed that online assessment did not actually assess the process of learning but more towards facilitating the management of online assessment.

Assessment is vital for improvement in learning and teaching and accountable to students, parents, stakeholders and public and to seek accreditation. Designing effective assessment techniques is an essential part of effective learning and teaching in conventional or online environment. As educational institutions are increasingly held accountable for student learning (Association of American Colleges and Universities 2004) assessment represents an important way to respond to such accountability. However, student assessment geared solely for accountability reasons does not necessarily lead to learning and performance. Educators need to consider the purpose of assessment, the criteria being measured, and the intended outcomes before meaningful assessment methods can be achieved (Gaytan & McEwen, 2007). The main purposes of assessment are to monitor student learning, improve academic programs, and enhance teaching and learning (Chappuis, Stiggins & Chappuis, 2005) The main purposes of evaluation are to facilitate student learning and to improve instruction. Teachers make judgments about student progress based on information gathered through a variety of assessment strategies. This information assists teachers in planning or modifying their instructional programs, which in turn helps students learn more effectively. Evaluations are also used for reporting progress to students and their parents, and for making decisions related to such things as student promotion.

EDUCATION ASSESSMENT DEFINED

Education assessment refers to the process of documenting, usually in measurable terms, knowledge, skills, attitudes and beliefs. The purpose is to measure student learning in a particular unit of study and overall aims of the programme and the qualities of the graduating student (Suskie, 2009)

Assessment sometimes known as evaluation consists of formative and summative evaluation. As teachers or trainers, anytime you assess your students, either in classroom face-to-face or at a distance using online technologies, you may either use summative or formative assessment. Formative assessment is constructed to measure the ability of the students at a particular unit in the course so as to enable them to identify the strengths and weaknesses to prepare them for the final exam. In formative assessment, students receive feedback from teacher or engage themselves in discussions to enable them to learn and perform better. It is typically intended to generate feedback to improve and accelerate student learning (Sadler, 1998). Students do not get any grade but are given assistance to help them to improve learning or performance. Formative assessment is also known as "continous assessment" (Erickson, 2007), or "dynamic assessment" (Shepard, 2000).

On the other hand, summative assessment is constructed to measure students overall performance and grade is usually awarded as in written examination. In summative assessments, you tell your students their scores or the final results usually at the end of a lesson, unit, week or semester. Summative assessments are conducted during examination week for example multiple choice or essay type questions.

RE EXAMINATION OF ASSESSMENT METHOD (CONVENTIONAL FACE-TO-FACE METHOD)

Asia e University is an Open and distance learning university, established in 2007 under the Asia Cooperation Dialogue consisting of 31 member countries in Asia. The university practised blended learning, a combination of Face-to-Face mode and online learning. In 2010, AeU Assessment Committee re examined the post graduate assessment component in the courses offered by the Schools and to suggest appropriate methods for the face-to face mode as well as the online mode. The rationale for re examination of assessment was to react to students complaint about the workload and types of assessment. Currently, there are two types of assessment offered by 4 schools: formative and summative evaluation. The Schools administered formative evaluation to post graduate students during the first half of the four-month semester and later followed by summative evaluation at the end of the semester. The current assessment distribution is 60% formative assessment allocated for the assignment and 40% summative assessment for the final examination. Both assessments are graded. Two assignments are given to students before they sit for the final examination and they are graded on the basis of 60% distributed equally or proportionately (20% 40%). The 60% marks are accumulated from the minimum two written assignments assigned to students. The assignments can be in the form of project, case study, essay and presentation and are predominantly face-to-face type (Figure 1) Each School decides on the types of assignment based on learner characteristics, program objectives and learning outcomes of a particular course. The assignments are designed to measure the ability of the students to solve real world problems involving higher order thinking and meta cognition. There is no online assessment in the courses offered even though the course is blended. About 12 hours or 20-30 % of the course are allocated online where students are expected to interact with the instructor using asynchronous forum available in the Learning Management System, email and instant messaging through mobile technologies. In other words there is no synchronous or asynchronous online learner–instructor interaction to execute the online assessment. From previous experience instructors observed that students may not be able to take online test due to Internet accessibility as well as the reliability of the test.

Figure 1: Assessment Distribution Offered By Schools

School	**Assessment Distribution**	**Online Assessment**
School of Management	• Assignment 1 30% • Assignment 2 30% • Final Exam 40%	No

School of ICT	• Assignment 1 30% • Assignment 2 30% • Final Exam 40%	
School of Education and Cognitive Science	• Assignment 1 20% • Assignment 2 40% • Final Exam 40%	
School Of Graduate Studies	• Capstone 100%	

In Doctoral Programme by research, capstone evaluation involving formative and summative evaluation is administered. The formative evaluation begins with writing of proposal, collecting literature review, collecting and analysing data, reporting the findings and making recommendations. The summative evaluation starts with presentation, oral-viva and final submission of thesis/dissertation (Figure 2)

Figure 2: Assessment Distribution For Doctoral Program
(By Research)

Assessment Type	**Total**
Presentation	100%
Oral-Viva	100%
Online-Asynchronous	100%
Online- Synchronous	0
Thesis /dissertation	100%

LEVELS AND TYPES OF ASSESSMENT

In the post graduate program (Coursework type), most of the students are working adults or experienced people and the kind of assignments given to them may consider their working experiences and interest in their related fields. This is the kind of flexibility practised in most open and distance learning program. The assignment component measures the ability of the students to analyse, synthesise and evaluate theories and concepts. It covers the higher levels of Bloom's Taxonomy. On the other hand, the examination component will measure students' ability to understand, comprehend and apply basic theories and concepts. It covers three levels of Bloom's cognitive learning hierarchy. The questions are in essay form and to be answered in three hours. However, in certain courses students are allowed to take open book test. In this situation the examination questions are constructed to measure the ability of the students to apply, evaluate or construct new knowledge. Figure 3a and 3b shows the levels of assessment and types of assessment for present and future programs, respectively.

Figure 3a: Assessment Levels Based on Bloom's Taxonomy
Masters in Business Administration (MBA)

	PRESENT PROGRAM		**FUTURE PROGRAM**	
	Assignment	Exam	Assignment	Exam

Percentage	60%	40%	60%	40%
Level (Learning Hierarchy)	4-6 Level Bloom Taxonomy	1-4 level Bloom Taxonomy	4-6 Level Bloom Taxonomy	1-4 level Bloom Taxonomy
Learning domain	Cognitive, Affective	Cognitive	Cognitive, affective and psychomotor	Cognitive and affective
Types	Question based (Individual)	• Question based • Case study • Short answer Questions	Question based (Individual)	Question based

Figure 3b: Types of Assessment

PRESENT PROGRAM Assessment Methods		FUTURE PROGRAM Assessment Methods	
Assignment	Exam	Assignment	Exam
• Essay writing (Individual)	• Case study • Essay • Short answer • Open book	• Essay writing (Individual)	• Case study • Short answer
• Case study • (PBL) (Individual)		• Case study (PBL) (Group) • Seminar	• Oral • presentation • Take home • exam
• Paper review (Individual.)		• Paper review (Ind.)	• Online exam • Online quiz
• Project paper (Individual.)		• Project paper (Individual) • Portfolios • Peer review • Self-assessment	• True/False/ • Multiple • Choice • Questions

(Assessment methods are subject to learning outcomes of individual subjects)

ONLINE MODE: ASSESSMENT METHOD

As a distance learning university, using blended mode the recommended course to be offered online is more than 70% online and 30% face-to-Face (Allen & Garrett, 2007). At AeU, the courses are offered online in the form of self-instructional modules parked in university Learning Management System. Learners interact independently with the digital modules (SIM) for 16 weeks doing the learning activities and formative assessment. No grades are recorded in this learner-module interaction. To supplement the 70% online learning, students attend the face-to-face tutorials three times in a semester. To make up the 10 hours online interaction between lecturer and students, online forum and online quiz are recommended. Both assessment is instructor-led not peer assessment. The AeU Learning Management System (LMS) has two online collaboration features which may be used by blended students to enhance their learning:

- Forum and quiz to be utilized by academic facilitators and full time students enrolled in online learning or blended learning.
- To award 5% as part of the total assignment distribution (60%) for forum interaction
- No mark is given for quiz. It is an online exercise (Formative evaluation) to ensure learners' mastery of every chapter/learning unit (Knowledge and comprehension level) especially for the Undergraduate program
- To set up multiple-choice question banks
- Thesis/Dissertation: Capstone Evaluation (100%): Summative Evaluation

THE BENEFITS OF ONLINE ASSESSMENT

Many studies indicated that online assessment has an impact on learners' critical and creative thinking skills. Forums and quiz are two useful tools that can be used to encourage students to participate in online assessment

The advantages of using forum are:

- To have one-to-one or group discussion (Collaborative dialogue) as well as interaction to facilitate students' engagement and prevent isolation.
- To substitute the face-to-face component especially for fully online students
- To nurture critical thinking skills and problem-based learning such as analysis, synthesis (create) and evaluation using web 2.0 social media
- May generate ideas which may not arise during real-time classroom discussions.,
- Elicits responses from quieter students who shy away from speaking up in class by providing a more comfortable discussion venue in which to contribute.
- Provides individual points, as well as whole online discussion threads, that can be referenced in class, enriching the discussion and acknowledging thoughtful ideas.
- Student comments can be read and validated fairly quickly, showing that students are invested in their ideas.
- Students expand their personal knowledge-base through the back-and-forth engagement and interaction with other classmates sharing insights, perspectives, points-of-view, as well as their personally held information and knowledge.
- Student learning and behavior is affected by and often led by assessment requirements (McLoughlin & Luca, 2001).
- Effective flexible learning regimes require assessment to be appropriately designed to match the new learning environments and diverse clientele (Booth, Hartcher & Hyde, 2002).
- Developing expertise and capabilities in online assessment can provide market opportunities. Many industries, particularly larger ones, have a major challenge managing skill development of employees and a lot are now developing their own in-house training programs (Anderson, 2001).
- Assessment for online is underpinned by the same principles of validity, reliability, flexibility and fairness, and uses many of the same strategies used in traditional face-to-face teaching (Booth, Clayton, Hyde, Hartcher & Hungar 2002).
- What differs mostly is the context of the assessment, the interactions between assessor and those being assessed, and collection and administration processes.

For quiz, the benefits are:

- To evaluate student knowledge and comprehension level (Bloom's Taxonomy) at the end of a chapter/learning unit
- Provide immediate feedback and grading
- Randomized question order,
- Item analysis of the questions, and obtaining the scores immediately after the exam.
- To keep up with materials covered within each course

PROPOSAL FOR ONLINE ASSESSMENT

Online assessment needs to be carefully planned and be instituted as an e-learning policy in higher education. It also requires a strong commitment from the stakeholders, lecturers and students to

implement online assessment. AeU suggested the following procedures to implement the online assessment.

Forum and quiz are the two most common online tools used to assess student learning in an online environment. To activate the forum interaction between lecturer and student, the following steps are recommended:

- Facilitator shall prepare at least one discussion topic for each three weeks. So for a 14 weeks semester, there should be not more than 5 discussion topics to be posted on the discussion forum for each course.
- Students will be given a timeline to discuss the topic. If students do not response within the stipulated period, the discussion topic will be deleted and no marks will be awarded.
- For every discussion topic, 1 mark is given by the instructor
- Marks will be assessed on the number of responses or hits and the substance of the discussion. No peer assessment recommended at this initial stage
- Facilitator shall monitor and track the students' responses once in every two-day basis and response to students' questions.
- To develop a program that can monitor and track students participation

To activate the quiz online between lecturer and student, the following steps are recommended:

- Academic facilitator shall prepare one quiz for every chapter. The number of questions shall be between 5 to 10 questions for each quiz.
- Since the questions are picked randomly by LMS, it is recommended that more questions to be created in the question banks.
- The marking of quizzes will be done by LMS. Facilitator will only need to view the progress reports. Mastery will be based on criterion-referenced test.
- Students should be allowed to take the quiz again if they do not achieve the criteria set.
- There must be a team to develop question bank

SUGGESTIONS FOR IMPROVEMENT ON ASSESSMENT

Based on the observation and feedback from the students, the AeU Assessment Committee has recommended the following suggestions to improve the online and the conventional assessment:

- To improve assessment activities in self- instructional module to enhance formative evaluation.
- To focus on learner-centered learning process with informal scoring as a form of motivation for learning.
- Systematically designed using ID.
- To activate and improve online formative assessment based on teacher-centered learning (TCL) and learner-centered learning (LCL).
- To improve capstone assessment protocol in doctoral research-based program, Supervisor-supervisee pre assessment session is recommended before oral defense (formative assessment online using video conferencing or face-to-face
- To standardize assessment structure using Table of Specifications in which levels of Learning outcomes (using Bloom's Taxonomy) and weightage will be specified.
- To establish standard operating procedures (SOP) for fully online Academic Faciliator (assessment procedure)
- To provide incentives for Academic Facilitator in blended mode and fully on online participation and assessment.
- To treat formative assessment as a process (Popham, 2008)

CONCLUSION

Effective online assessments should include a wide variety of assessment methods depending on the

learning outcomes. Appropriate assessment methods such as projects, portfolios, forum with immediate feedback, timed tests and quizzes, and asynchronous type of communication using the discussion board. Feedback is also a critical component on online assessment. It must be meaningful, timely, and should be supported by a well-designed rubric when possible. The assessment value of e-mail messages, quiz, and discussion board postings should not be ignored as they provide opportunities for the instructor to know whether the students understand the instruction and are correctly interpreting the assessments. On line Learning technologies will support T & L either in the conventional mode or online environment. Studies showed that online learning can improve achievement and provide rich enviornment for learning. The assessment tool, if carefully designed may help to facilitate and improve learning particularly in the ODL mode.

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A STUDY OF 8th GRADERS' PERCEPTIONS OF SOCIO-CULTURAL PERSPECTIVE OF CREATIVITY BY USING INFORMATION TECHNOLOGY TOOLS IN REALISATION OF HOMEWORK GOALS

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ABSTRACT

The study aims at evaluating the perceptions of 8th graders towards the use of information technologies ranging from the internet and multimedia tools in socio-cultural perspective of creativity while they are doing their homework in the light of the National Education Ministry's regulation related to elementary and secondary school students' extra-curricular activities. The population of the research that was realised by data collected through survey method consists of 8th grade students in elementary and secondary schools in Istanbul. Randomly chosen 435 students from five schools in Istanbul make the sample of the research. In terms of students' perceptions, results of the study show that regardless of gender, students enjoy discovering and exploiting online and offline resources through problem solving skills especially when they have the opportunity to do this on their own, which also shows that they think they feel more confident, mobile and creative in cyber but socio-cultural reality.

Keywords: homework, creativity, information technologies, multimedia

ÖZET

Bu çalışmada, ilköğretim 8.sınıf öğrencilerinin ödev yaparken Milli Eğitim Bakanlığının "İlköğretim ve Ortaöğretim Kurumlarındaki Öğrencilerin Ders Dışı Eğitim ve Öğretim Faaliyetleri Hakkında Yönetmeliği" ışığında sosyo-kültürel yaratıcılık bağlamında internet ve çoklu ortam araçları gibi bilişim teknolojilerini kullanımlarına yönelik algılamalarını değerlendirmek amaçlanmıştır. Anket yöntemi ile elde edilen verilerden oluşan araştırmanın evrenini, İstanbul ilindeki ilköğretim okullarında öğrenim gören 8. sınıf öğrencileri oluşturmaktadır. Araştırmanın örneklemi ise, beş ilköğretim okulundan tesadüfi örnekleme ile seçilen 435 ilköğretim 8. sınıf öğrencisidir. Araştırmanın sonuçları, öğrencilerin, algılamaları açısından cinsiyet gözetmeksizin çevrimiçi ve çevrimdışı kaynakları kendi başlarına kullandıklarında problem çözme becerileri ile keşfetmekten ve tüketmekten hoşlandıkları, bunun da sanal ancak sosyo-kültürel gerçeklik bağlamında kendilerine daha fazla güven, hareketlilik ve yaratıcılık sağladığını göstermiştir.

Introduction

Technological advances make us reconsider and ascertain whether new instructional methods modify or even magnify children's learning styles. Some studies report change in learning style as a function of computer-assisted learning. As the internet and other computer-based communication tools become prevalent in homes and schools, students' use of these tools for their homework will rise. As a result, the new trend in doing homework has also been under great changes and influences from past to present. The issue bears essential focal points to study in terms of students' changing perceptions and attitudes towards homework along with the importance attached to it. In this respect, style of new homework trends especially with young learners would be of greater concern to examine.

In addition, homework is a powerful tool that can contribute to the advancement of children's education and knowledge. Homework is a kind of out-of-school learning that has not yet received the serious

attention that it merits in the research literature. School systems need to give serious attention both to increasing awareness of homework motivation and preferences in children and in parents and to providing them with the information and techniques required to accommodate homework assignments to these preferences as well as their motivation levels and sources (Milgram. 2000). Schools that can meet similar needs are more likely to promote a better understanding of homework.

When we talk about homework, we assume that homework should reflect a productive and participatory aspect of learning in which learners' involvement is the most significant element. Using today's technological instruments as facilitators, a well-assigned homework is meant to stimulate students' creativity and the need to communicate and share with his or her peers in rich learning environment. In this respect, creativity is conceived as a product of two different types of mental processes. First some processes are used in the generation of cognitive structures (memory retrieval, association, mental synthesis, mental transformation, analogical transfer and categorical reduction). The second type of processes cover those used to explore the creative implications of the structures (attribute finding, conceptual interpretation, functional inference, contextual shifting, hypothesis testing and searching for limitations). According to the socio-cultural perspective, understanding creative people and objects demonstrates that artistic innovations emerge from joint thinking, exchanges among people, which emphasizes the role of social dimension of creativity. In the socio-cultural perspective creativity relies on experience, needs and interests in which needs are expressed (Decortis & Lentini, 2009).

Creative individuals are generally very good problem solvers and enjoy a variety of experiences. They have an ability to read a book or look at a situation and each time the book or situation is revisited, a new idea or approach is developed. Creativity thrives on emotion and is process driven rather than focusing on the end result. School is very goal oriented. Although we may like to think that students should learn 'for the sake of learning, the reality is that the goal of most schools is to have the students perform well on the exam. For a student to do well in this system, the student needs to be driven by wanting to complete a goal. Students should view assignments as part of a process and not as end result. (Weiner, 2010).

Thus, an educational system that is based on creativity encourages the creativity and works for achieving creativity. It is too necessary to educate and train the people who can develop the society towards the best, who can use their creative capabilities and take the responsibilities of competitive changing world on the national and international basis. The doubling of knowledge is taking place in less time while we are advancing forward. This cumulative knowledge only can be learned just by an educational system that depends on aiming creativity and using methods of creativity. The basis of development and improvement is formulated by advanced technology. Technology is a product of creative works and is a very wide and fertilized area for creativity (Rıza, 2001). By using technological aids in homework preparation process, it should not be wrong to look for the ways of improving and reinforcing creativity with other personality traits from socio-cultural perspectives.

Literature Review

The use of technology in the classroom to enhance student achievement is a timely topic that pervades educational literature today. However, the literature is practically devoid of evidence for the uses of technologies to enhance both short- and long-term homework assignments. Teachers often assign homework to provide extra practice to students without regard to individualized needs for such practice. In turn, homework is often viewed by students as nothing more than "busy work" and therefore inconsequential to their learning. Technology can be used to change these three types of homework from paper-and-pencil "chores" or "busy work" to motivating learning opportunities that extend classroom learning into the home. Emphasizing a student's individual abilities and interests with regard to homework has been a daunting task in the past. Not many teachers had the time or energy to assign individualized homework assignments to meet student needs. In fact, the same assignment—one that all students could complete—was often given to all students regardless of their individual instructional needs, thus resulting in the "busy work" perception. Using technology, teachers can now move from the

role of "assigner and designer" of the homework assignment to "facilitator" for the homework reinforcement process. Rather than requesting that all students complete a specified generic assignment, the teacher can ask students to use technology to practice the skills or display the knowledge learned. Extending the use of technology to the home by assigning meaningful homework accomplishes three goals. First, it encourages meaningful homework assignments designed to meet the individual reinforcement needs of students. Second, it provides practice of valuable technology skills that will serve students well beyond the completion of the homework itself. And third, it provides students with homework activities that are engaging and fun (Zisow, 2000).So homework can be considered as a fruitful tree with numerous branches to hold on.

Homework is intended to be a positive experience that encourages children to learn; assignments should not be viewed as punishment. Research on homework during the last decade began to focus on the relationship between homework and student achievement, and has greatly strengthened the case for assigning homework. Although there are mixed findings about whether homework actually increases students' academic achievement, many teachers and parents agree that homework develops students' initiative and responsibility, and fulfils the expectations of students, parents, and the public (Milbourne, Linda A. - Haury, David L., 2000). On the other hand, how to realizes this still remains to be an issue of various discussions in the literature.

Homework, without any support and guidance especially for young learners, can go no further than being just a "mission impossible" for both learners and families. For that reason, traditional understanding of homework and its prerequisites need revision or second thoughts so that a more creative, collaborative and supportive approach can be developed to enhance learners' performance and enthusiasm. In that sense, technology and learners' perceptions of its role are issues that have different reflections on the tasks and responsibilities taken up during the learning process. Human beings as social creatures blended with culture are forced to state a purpose and take a position in this very digital age. Learners are no exception to this rule; neither can they be exempted from it.

Method

The study aims at measuring the relationship between the perceptions of socio-cultural perspective of creativity of 8th graders and the use of information technologies while doing homework. In addition, variables such sharing, cooperation, researching, problem solving, entertainment, self-confidence and communication were studied within students' socio-cultural creativity while organizing their homework in the light of the Turkish Ministry of National Education's regulation related to elementary and secondary school students' extra-curricular activities. For data analysis, frequency analysis and t-test were used.

Findings

Frequency Analysis

In the study, 48, 7 % of participants were male and 51, 3% were female. The character traits (CT) question regarding which aspect they think doing homework by using the internet and computer tools reinforce had six choices: 1) Sharing 2) Cooperation 3) Researching 4) Self-confidence 5) Creativity 6) Communication. The frequency data for each choice has the following results:

92,2 % of the students think that using the internet and computer tools while doing homework helps them regain self-confidence followed by 88,7 % for cooperation, 82,1 % for communication, 78,4% for sharing, 75, 9 % for creativity. 16, 1 % of students reported that the internet and computer tools did not help them develop their research skills.

As to whether students discuss the homework topic online, 59, 1 % reported they did so. While 58, 6 % of students discussed it with their friends, 25, 4 % with family members and 16 % with their teachers.

Concerning the most frequent tool they used for discussing homework topics was chat programs by 56,1 %, which was followed by e-mail (20%), face to face (17,8 %) and telephone (5,3%).

While doing their homework on the internet and computer, by 43, 9 %, students stated that they preferred to do it on their own and 34, 7 % with their friends.

Finally, as to the question whether they benefited from the internet and computer tools about experiments, observations and inventions included in their homework, by 85,5 % students responded " Yes" and by 14, 3 % " No"

t-Test

As a result of the t-test that was applied to see whether there is a significant difference among female and male students related to the answers given to the questions as to whether they think that they gain problem solving skills (PS) research opportunities (R) and they entertain themselves (E) while doing homework by using the internet and computer tools, following findings were obtained:

Table 1: Descriptive Statistics

	Sex	N	Mean	Std. Deviation	Std. Error Mean
PS	Male	211	2,2512	1,10774	,07626
	Female	222	2,1712	1,00112	,06719
R	Male	212	1,8349	1,01930	,07001
	Female	222	1,9099	1,00271	,06730
E	Male	212	1,6557	1,15579	,07938
	Female	221	1,5294	1,00240	,06743

The above Table shows that there is no significant difference between the averages and standard deviations of the related answers given to the three questions (PS, R and E) by 211 male and 222 female students.

As a result of the t- test that was applied to see whether there is a significant difference between female and male students related to the answers given to the questions PS, R and E, no significant difference was found at 5% significance level. (Significance values > 0, 05 were highlighted).

Table 2: t-Test for Differences between the Genders

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
PS	Equal variances assumed	2,317	,129	,789	431	**,430**	,08001	,10138
	Equal variances not assumed			,787	421,328	,432	,08001	,10164
R	Equal variances assumed	,166	,684	-,773	432	**,440**	-,07500	,09707
	Equal variances not assumed			-,772	430,314	,440	-,07500	,09711
E	Equal variances assumed	4,331	,038	1,216	431	,225	,12625	,10385
	Equal variances not assumed			1,212	417,084	**,226**	,12625	,10415

As a result of the t- test applied to see whether there is a significant difference between the answers given to the questions PS, R and E and the answers given to the questions whether they benefit from a single source (SS) or multiple sources (MS) while doing their homework on the internet and computer, following results were obtained:

Table 3: Descriptive Statistics

	SS and MS	N	Mean	Std. Deviation	Std. Error Mean
PS	From a single source	53	2,3019	1,15334	,15842
	From multiple sources	380	2,1974	1,04034	,05337
R	From a single source	53	2,1111	1,16013	,15787
	From multiple sources	380	1,8395	,98432	,05049
E	From a single source	53	2,0000	1,35873	,18664

	SS and MS	N	Mean	Std. Deviation	Std. Error Mean
PS	From a single source	53	2,3019	1,15334	,15842
	From multiple sources	380	2,1974	1,04034	,05337
R	From a single source	53	2,1111	1,16013	,15787
	From multiple sources	380	1,8395	,98432	,05049
E	From a single source	53	2,0000	1,35873	,18664
	From multiple sources	380	1,5342	1,02547	,05261

The above Table shows that while 53 students benefited from a single source, 380 students benefited from multiple sources while doing homework on the internet and computer. No significant difference was found between the averages and standard deviations of the answers given to the three questions by students in both groups.

Table 4 : t-Test for difference between SS and MS

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
PS	Equal variances assumed	1,880	,171	,676	431	**,499**	,10452	,15464
	Equal variances not assumed			,625	64,358	,534	,10452	,16717
R	Equal variances assumed	1,168	,280	1,854	432	**,064**	,27164	,14653
	Equal variances not assumed			1,639	64,304	,106	,27164	,16575
E	Equal variances assumed	12,141	,001	2,966	431	,003	,46579	,15707
	Equal variances not assumed			2,402	60,538	**,019**	,46579	,19391

As a result of the t-test applied to see whether there is a significant difference between " benefiting from a single source" and " benefiting from multiple sources" related to the questions PS, R and E, no significant difference was found for questions PS and R at 5% significance level and similarly for the students in both groups (sig. values>0,05). On the other hand, in parallel with the answers given to question E, a significant difference at 5% significance level was found between the students in two groups. (Sig. value <0, 05).

Related to the answers given to the questions PS, R and E, in order to find whether there is a significant difference regarding the question whether students discuss (D) the homework topic or not while doing their homework, following results were founds as a result of the t-test applied.

Table 5: Descriptive Statistics

	D	N	Mean	Std. Deviation	Std. Error Mean
PS	Yes	257	2,0817	,99860	,06229
	No	170	2,4000	1,10620	,08484
R	Yes	257	1,8288	,97721	,06096
	No	170	1,9474	1,06419	,08138
E	Yes	257	1,5798	1,06912	,06669
	No	170	1,6000	1,10083	,08443

The above Table shows that while 257 students discussed the homework topic, 257 of them did not so. While there is no significant difference between the averages and standard deviations of the answers given to the questions R and E by the students in two groups, it was observed that the averages differentiated in question PS (yes:2,08 no:2,4)

Table 6: t-Test for D

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
PS	Equal variances assumed	6,608	,010	-3,088	425	,002	-,31829	,10308
	Equal variances not assumed			-3,024	335,879	**,003**	-,31829	,10525

R	Equal variances assumed	,720	,397	-1,186	426	**,236**	-,11857	,09995
	Equal variances not assumed			-1,166	342,645	,244	-,11857	,10168
E	Equal variances assumed	,213	,645	-,189	425	**,850**	-,02023	,10695
	Equal variances not assumed			-,188	354,557	,851	-,02023	,10759

Related to the answers given to the questions PS, R and E, as a result of the t-test applied in order to find if there is a significant difference between whether students "discuss the homework topic" and "not discuss it" (question D), no significant difference was found between the two groups of students for questions R and E at 5% significance level (sig. values>0,05). On the other hand, in parallel with the answers given to the question PS, a significant difference at 5% significance level was found between the two groups of students.

Conclusion

As specified in the related parts of the National Education Ministry's regulation related to elementary and secondary school students' extra-curricular activities, homework, an essential tool in education, is meant to serve as a basic socio-cultural educational medium that helps student develop and improve personal and academic skills. Our results regarding socio-cultural perceptions of 8th graders' creativity show that young learners feel freer, more confident and secure while they are using the internet and computer tools while doing homework. Although most children like participants in our study feel more comfortable with the use of online and offline tools in their engagements, it should be kept in mind that apart from their enhanced efficiency, computer technologies alone should not be prescribed as a unique cure for extra-curricular educational activities such as homework. Our study is meant to shed light on how students in the study perceive computer mediated homework performance and preparation techniques in terms of socio-cultural creativity in comparison to what is stated in the school regulation. Obtained results in general put forward a positive but still attentive approach concerning students' use of computers and the internet tools in doing homework. The line between education and homework is so delicate that objectives and tools stated in the Ministry's regulation regarding homework can change lines depending on how computers and the internet enter the scene. We hope that this study has managed to draw attention to highlighted theory and changing practice of students' productivity and creativity perceptions from both social and cultural perspectives for the present and future applications.

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A Usability Study of Interactive Web-based Modules

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ABSTRACT

This research advances the understanding of the usability of marketing case study modules in the area of interactive web-based technologies through the assignment of seven interactive case modules in a Principles of Marketing course. Using a survey instrument, the study examines student perceptions of how useful the interactive modules are in students' learning the selected marketing concepts, how difficult/easy for students to use the modules, and how helpful the module assignment were in receiving a better course grade. The results indicated that students perceived that the modules were easy to use and useful in learning of the marketing concepts. The number of completed modules increased students' actual course grade and module assignment grade. On an average, students indicated that the ideal number of interactive modules was seven in a semester. Students' class attendance was positively correlated with their grades. Females achieved a higher module assignment grade than males did.

Key Words: Interactive modules, Web-based technology, Usability

INTRODUCTION

Case studies provide an important tool to help students develop analytical thinking and problem-solving skills through applied construction of reality (Henson, Kennett, and Kennedy 2003). In a Principles of Marketing course, for the first time many students are faced with having to organize, categorize, and solve the problems at hand, and may be overwhelmed with the process. Often, in a Principles of Marketing course, students decide to become marketing majors. In the past, it has also been reported that while there has been a decline in marketing majors, there has also been a decline in the quality of students interested in marketing (Hugstad 1997; Newell, Titus, and West 1996). Although marketing educators debate this idea, many surveys also show a decline in students' interest in reading text books. Following target market trends, publishers of major marketing text books are downsizing texts by creating interactive text books as well as magazine-like texts (See Pearson/Prentice Hall and Thompson Learning for examples).

The latest demographic research suggests that the current student is part of a Nano Generation which is multi-task oriented, multi-modal, and has an attention span of about five minutes. As marketing educators face a changing student demographic, it is important to consider whether or not the pedagogies used in the past still foster student learning (Karns 2005), and how computer technology might aid in knowledge transfer of productive pedagogies. It is imperative, given such trends, that marketing educators seek to promote constructive discourse regarding ways to contemporize existing pedagogies as well as add new learning activities to the mix to meet the needs of a changing student profile that include learning styles and habits that differ from previous generations.

Computer-aided interactivity appears to be an established method that can be used in the marketing classroom as a tool to match the marketing student's learned aptitude and comfort with computer technology with traditional marketing pedagogies in order to learn marketing concepts. Jaffee (1997, p. 268) defines interactivity as "regular interaction between teacher and students, among students, and between students and the learning environment." Computer-aided interactivity uses computer programs to enhance learning with activities that users can respond to (Pickett et al. 2000). Although much has been written about how computer-aided interactivity enhances the students' learning process, there is little empirical evidence about

how students learn with technology (Close, Dixit, and Malhotra 2005). Furthermore, Achenreiner (2001) suggests that more studies are needed that match existing pedagogies with technology interfaces.

With this concern, this study compares and reports student outcomes and perceptions of Principles of Marketing case studies in a web-based format for individual students. It advances the understanding of the value of technology as a tool for learning how to solve case studies and describes the student perceptions of using web-based case study modules. Studies about student perceptions in traditional classrooms (face-to-face courses) that also use computer-mediated communications (CMC) are limited (An and Frick 2006).

Because marketing educators may not have the time or resources to develop web-based, computer-aided case study assignments, they may choose to use the web-based interactive case study modules that accompany textbooks to supplement their lecture-based teaching methods. The authors believe that computer-aided teaching methods are useful in student learning if implemented effectively. Research suggests that CMC may be preferred by diverse learners because they can interact with case study materials on-line and have time outside of the classroom to review and comprehend the materials. Furthermore, students are not expected to communicate verbally and process non-verbal communications at the same time. Given our diverse student profiles, including students with disabilities, students who learn English as a second language, or students who are shy to speak in public, it has been suggested that CMC may be useful in helping students focus on the case study information at hand more effectively (Berge and Collins 1993; Harasim 1990; Leasure, Davis, and Thievon 2000). Finally, CMC has been found to equalize participation between participants by providing a virtual façade that allows students to be themselves (Hiltz, Johnson, and Turoff 1986; Kiesler, Siegel, and McGuire 1984; Phillips, Santoro, and Kuehn 1988).

LITERATURE REVIEW

Marketing educators are challenged with how to integrate technology into their courses to enhance student learning of marketing concepts and prepare them for careers in marketing. Hannaford, Erffmeyer, and Tomkovick (2005) report that most educators have integrated technology into traditional courses through an "infusion approach" (p. 68). Infusing technology into the classroom has evolved over the last decade. In a study of student outcomes using electronic tools, Clarke III, Flaherty, and Mottner (2001) confirm that technology created portals for learning and enhanced the learning experience. Close, Dixit, and Malhotra (2005) state that while technology and the Internet "facilitate" and "enhance learning" (p. 91), there is little known about how students learn with technology. Strauss and Frost (1999) suggest that it not only enhances learning but that it increases skills needed in marketing careers.

Studies regarding technology's effectiveness in the marketing classroom are limited (Close, Dixit, and Malhotra 2005). Malhotra (2002) points out that while there are many advantages to using technology; educators need to maintain a balance between traditional and electronic methods. Karns (2005) finds in a study of marketing student perceptions of learning activities that using technology generates a positive response by students if they are real world based. Karns (2005) states, "Students' willingness to engage fully in learning through a particular pedagogy is an important element in a pedagogical approach's ability to foster learning" (p. 165). Marshall and Michaels (2001) point out educators should use technology that is driven by the course's focus and content. Furthermore, there are few pedagogical studies about how technology interfaces with different approaches to learning, such as case studies and problem solving and this is one area that needs further examination (Achenreiner 2001).

Web-based delivery systems are popular electronic tools that have been effectively used in diverse marketing courses. Its overall advantages over traditional course methods for students include interactivity, real-time communication, and self-motivated learning. Furthermore, it supports multiple data formats such as audio, video, and graphics, and can be updated when necessary (Kaynama and Keesling 2000). However, research on the effectiveness of web-based delivery systems for different learning approaches is limited and marketing educators wonder if technology actually adds to student learning of marketing concepts (Close, Dixit, and Malhotra 2005).

Case studies are a traditional pedagogical tool used by marketing educators to build marketing problem-solving skills, gain real world knowledge, and develop marketing concepts. Traditionally, case studies have been taught by using textbooks or paper cases such as Harvard Business School case studies. Various studies have been conducted to demonstrate the value of web-based cases versus paper cases. Mabrika (2003) uses an online case study which contributed to learning about the impact of multimedia in improving higher-order cognitive skills with marketing students. Liebowitz and Yaverbaum (1998) demonstrate that web-based cases are more enjoyable than paper cases with information systems students.

Given a student's cumulative experience with problem-solving, it is unclear whether or not a positive or negative experience with case studies impacts his/her choice of a major in business. In a study of students' decision-making processes in selecting a business major, marketing students rated the need for interesting course content and variety the highest on their attribute importance scale (Newell, Titus, and West 1996). Furthermore, (Newell, Titus, and West (1996) find that marketing students felt that their quantitative skills are lacking.

Therefore, this study investigates whether interactive case study modules for Principles of Marketing students are easy to use. The study further investigates whether the number of interactive case study modules completed lead to a higher overall course grade, and an overall module assignment grade. In addition, the study examines whether students' semester standing and class attendance percentage are positively correlated with their perceptions of ease of completing the modules; lastly, whether gender and student's option make significant difference in the overall module assignment grade and course grade. The research objectives are as follows:

RO1: Students will find that web-based interactive case studies are easy to use. More specifically, their perceptions will be higher than being neutral.

RO2: The number of modules completed will positively correlate with students' course grade and overall module assignment grade.

RO3: Students' semester standing and class attendance percentage will positively correlate with their overall course grades and module assignment grades.

RO4: Differences exist in the overall module grades based on gender and student's option. More specifically, females and students of marketing/management option will receive higher module assignment grade and course grade.

METHODOLOGY

The web-based marketing case modules were provided for marketing students by the publisher, McGraw Hill Irwin, of the *Marketing* textbook by Grewal and Levy (2010) at the publisher's web site: https://cms.psu.edu/section/content/default.asp?WCI=pgDisplay&WCU=CRSCNT&ENTRY_ID=C3869829D49C48829AE1E2EF3B4FD375. The students were asked to complete seven module assignments as part of their course requirement throughout a semester at a large university in the United States. After the completion of seven interactive case modules, a voluntary participation in a survey was offered in order to investigate the objectives of the study. A total of 96 students who registered for a Principles of Marketing course participated in the study. As an incentive, one bonus point credit was offered for a voluntary participation in the survey and was counted toward students' in-class participation grade.

In order to test the usability of the web-based interactive case modules, fourteen scaled-questions were asked. In addition, actual course grade, overall module assignment grade, number of modules completed, student's class attendance percent, and student's semester standing were captured from the students' course grade sheet.

RESULTS AND DISCUSSIONS

The sample profile indicated that 69.5 percent of the students were males and 30.5 percent were females. Students of the marketing/management option comprised 48 percent of the sample, finance 12 percent, accounting 17 percent, entrepreneurship 3.4 percent, and other options 11 percent. Almost 8 percent of the students were undecided regarding their option.

A Principle Component Analysis with Varimax rotation revealed three dimensions with 60 percent variance explained. The item, "How clear was the language?" loaded on two dimensions. Because this item did not show clear measurement of a specific dimension, it was removed. The loadings are shown in Table 1. To examine RO1, one sample t-test with the test value of 3 (mid-point) is used and the means and standard deviations of the statements measured on a 5-point scale were examined. All of the means of the statements were significantly higher than the mid-point at $p < .01$ level (Table 1). This indicates that students perceived that the modules were easy to use and useful in learning of the marketing concepts. The reliability analysis revealed Cronbach's Alphas ranging from .61 to .86.

TABLE 1: Usability and Usefulness of Modules

Usability Items	Measurement Scale	Mean	S. D.	t-value	Loadings		
					CA=.86	CA=.74	CA=.61
1.While completing the modules, did you:	1= Feel completely lost; 2= Feel a little lost; 3= Neutral; 4= Know what to do most of the time; 5= Always know what to do next	3.78	.81	**9.3*** **		**.59**	
2.Compared to what you expected, did the tasks go:	1= Much slower; 2=Slower; 3=Neutral; 4=Faster; 5=Much faster	3.6	.76	**7.7*** **			**.82**
3. How easy/difficult was it to understand the tasks asked of you?	1= Very difficult; 2=Difficult; 3=Neutral; 4Easy; 5=Very easy	3.74	.84	**8.5*** **		**.81**	
4. Overall, how easy/difficult was it for you to complete required phases?	1= Very difficult; 2=Difficult; 3=Neutral; 4Easy; 5=Very easy	3.78	.81	**9.3*** **		**.61**	
5. How easy/difficult was understanding the information presented in the modules?	1= Very difficult; 2=Difficult; 3=Neutral; 4Easy; 5=Very easy	3.64	.77	**8.1*** **		**.55**	
6. How relevant were the graphics to the content?	1= Very irrelevant; 2=Irrelevant; 3=Neutral; 4=Relevant; 5=Very relevant	4.01	.89	**11.0*** **	**.57**		
7. How clear was the language?	1=Very unclear; 2=Unclear; 3=Neutral; 4=Clear; 5=Very clear	3.97	.83	**11.4*** **		.47[a]	
8. Overall, how easy/difficult was using the modules?	1= Very difficult; 2=Difficult; 3=Neutral; 4=Easy; 5=Very easy	3.99	.75	**12.8*** **			**.71**
9. Overall, how useful was the modules' content to your learning?	1=Very useless; 2=Useless; 3=Neutral; 4=Useful; 5=Very useful	3.47	.85	**5.3*** **	**.81**		
10. I completely understood the material:	1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree	3.46	.89	**5.0*** **		**.71**	
11. Working with the interactive modules was fun	1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree	3.37	.96	**3.8*** **	**.68**		
12. How helpful were the modules for you in learning specific course materials?	1=Not helpful at all; 2=Not helpful; 3=Neutral, 4=Helpful; 5=Very helpful	3.46	.89	**5.0*** **	**.79**		
13. Completing the modules helped me get higher grades on exams	1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree	2.72	.92	**-2.9*** **	**.77**		
14. Would you recommend the modules be used in future Principles of Marketing classes	1=Definitely no; 2=No; 3=Neutral; 4=Yes; 5=Definitely yes	3.78	1.0	**7.6*** **	**.81**		

****** p < .01***

[a] Deleted

To investigate RO2, a Pearson correlation analysis was performed. The number of completed modules was significantly correlated with students' actual course grade (.63) and module assignment grade (.98) at $p < .01$ level. The actual course grade and the module assignment grade was also significantly correlated (.66) at $p < .01$ level. On an average, students indicated that the ideal number of interactive modules was seven in a semester. In addition, the number of completed modules was not significantly correlated with any of student perceptions regarding the usefulness and ease of use of the modules.

In examining RO3, student's attendance record was positively and significantly correlated with both module assignment grade (.30) and overall course grade (.62) at $p < .01$ level. However, while students'

semester standing was not correlated with module assignment grade, it was negatively and significantly correlated with their actual course grade (-.30) and their class attendance record (-.33) at $p < .01$ level.

For RO4, a t-test was performed to see if females scored a significantly higher module assignment grade than males did. The course grade was not significantly different; however, females' module assignment grades (mean=93, n=29) were significantly higher than those of males (mean=86, n=66) with t= -2.17 at $p < .05$ level. Student's field of study (option) did not have significant relationship with their module assignment grade; however, the students with an option in finance (mean=93.7) had significantly higher course grades in the Principles of Marketing course than those with other options such as Accounting (86.5), and Entrepreneurship (80.9) option.

LIMITATIONS

This study used a convenience sample, and was limited to two sections of Principles of Marketing at one large university. Therefore, the study cannot be generalized to all Principles of Marketing students. Student's comfort level with technology and prior experiences or expertise with Web-based tools were unknown. Furthermore, some students may have technical difficulties using the modules during the submission process (incompatibility between Mac vs. Windows-based programs), which may or may not have biased the survey responses.

Time constraints also limited this study. If students underestimated the amount of time they needed and waited until the last minute to complete the module, this may have biased both student performance and survey results. Indeed, there were always a few students who submitted their answers at the last minute, right before the deadline.

Future research may include providing greater interactivity such as working in groups rather than individually and allowing students to collaborate and discuss the case while working on the module.

CONCLUSIONS

The findings from this study correspond with Pickett et al. (2000) that computer-aided interactivity enhances learning. Overall, students' feelings about the interactive case modules were positive; however, they did not feel that the modules helped increase their grades on exams. This is expected because the modules focus on specific concepts while exams assess a broad area of knowledge. This study found an interactive web-based case module helped the learning marketing concepts and were easy to use. Clarke III, Flaherty, and Mottner (2001) state that although there is no empirical evidence that it helps students learn, electronic interaction between students should be encouraged. The findings of this study are also consistent with those of O'Connor and Girard (2006) study that indicated modules made learning of the marketing concepts easier.

The number of completed modules was positively correlated with the module assignment grade and the course grade. This means students are encouraged to complete as many modules as possible to better their course grade. Student's attendance record was also positively and significantly correlated with both module assignment grade and overall course grade. However, while students' semester standing (e.g., freshman, sophomore) was not correlated with module assignment grade, it was negatively and significantly correlated with their actual course grade and their class attendance record. This finding warrants further research to understand why students with a higher semester standing have difficulty receiving higher course grade and attending the classes more frequently than their counterparts with a lower semester standing.

The study also found that the course grade was not significantly different between males and females; however, females' module assignment grades were significantly higher than those of males. This may result from the differences in learning styles between male and female students as documented in the literature (Karns 2006). Student's field of study (option) did not have significant relationship with their module assignment grade; however, the students with an option in finance had significantly higher course grades in

the Principles of Marketing course than those with other options such as Accounting, and Entrepreneurship option. This finding should be verified by looking at a larger sample and in various courses to be generalized.

In conclusion, marketing educators are encouraged to use tools that will motivate students to engage in the marketing process and learn the marketing concepts. If marketing education is to continue to effectively prepare students for employment and life, educators must understand the ways that technology and other educational methodologies inspire students (Clarke III, Flaherty, and Mottner, 2001). Therefore, infusing traditional pedagogy with technological advancements through survey methods and experiments and making the results available to educators can only advance the research on this topic.

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ALGOBASE, A SYSTEM FOR ASSESSING ALGORITHMS

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Abstract
An algorithm is a consequence of logical instructions that, once executed, reduce to a result and it is not always evident to good understand its functioning.
The progression of the technologies of information and communication and its availability in the teaching and in the learning offer the possibility to put at the disposal of the learners the tools that facilitate their learning. The algorithmic is a very important field in computer science; it is currently studied using different intelligent environments for human learning dedicated to each discipline.
Algobase, is an Environment for assessment algorithms and learning resolution with decomposition of tasks. This is an editor that offers the learner opportunities to create, modify, evaluate algorithms and view mistakes. The assessment in this Environment is done through a matching of solutions.
Keywords
Algorithmic, Matching, Organigram, Assessment, Environment…

PROBLEMATIC

The algorithmic is discipline that used for long time but in a naïve way (Caignaert, 1988), without particular formalism. This discipline is often source of problem for both the teacher and students. For the teacher, because he must find adequate methods to let the students grasp some of the abstract aspects that are in their beginning level. For students, the problem is much bigger. In testifies the rate of failure or dismissal from the initiating level in programming in the first cycle of the university vary from 25 to 80% worldwide (kaasboll, 2002). Works in cognitive psychology directly involves the nature of the taught discipline. These studies have identified the major axes of the intrinsic difficulties related to algorithmic:
• In the algorithmic, unlike other sciences such as physics, the beginning student has no model “naïf” of computer that might serve as a basis for building more sophisticated models. In opposite to, his experience with it seems to favor a modeling "anthropomorphic" which did not explain the sudden feedback which it is faced early in his practice of algorithmic (Guibert, 2005).
• Another specific difficulty in algorithmic is the abstraction of the task: the learner must factorize in the algorithm, the overall behavior of the task. The result is a "syndrome of the white page, highlighted in particular by Kaasböll (kaasboll, 2002). According to the students: "... when the problem is presented ... it breaks it down like that, like it like that. Everything seems simple and logical, and that's you and Ouch! Where do I begin? Perhaps it is easy, but the problem is that you do not know where to start when it should solve the problem.... ".
The following essential question arises:

- With witch pedagogic methods and tools could we improve the algorithmic learning?

Since some years, the integration of the technology of information and communication (TIC) has boosted the improvement of the quality of teaching and learning of different knowledge (Amerein, 1998). We support that appropriate use of TICs with innovative teaching methods and tools appropriated to the context, could be the solution to the problem of learning algorithmic.

The TLE has been known since some time considerable improvement efforts. Whatsoever in the manner of describe, to index pedagogic content but also to script pedagogic activities, formalisms imposed. In this evolution, evaluation is the poor relative. There is no particular formalism to specify the evaluation of learners. The evaluation, crucial dimension of the pedagogic activity, in its certificative role, formative, summative or normative, is widely found mistreated in the TLE.

This is in large part caused by difficulties of evaluation itself. Several tools and methods have been devoted but they are either ineffective (doubtful) or dedicated (they can't be applied to any field) (Daubias, 2003), (Allal, 2005), (Charle, 1977), (Labat, 20O2), (Benabbou, 2007).
Furthermore, the algorithmic activities of evaluation are among the most delicate, especially in a TLE, because the algorithmic is characterized by the multitude of solutions for a given problem. This feature increases the difficulty of evaluation in learning environments: the expert of the field finds difficulties in finding all possible solutions for a problem to integrate them into the database solutions. The localization of mistakes is an important fact of the progression of learners, is another problem caused by this feature. This makes the complex realization of these systems.

OUR PROPOSAL

To simplify the complex tasks, we need to decompose them into less complex ones and repeat this process until reaching a level of decomposition including basic operations and / or elementary ones. The algorithm solving the problem will be a composition of the late operations (basic and elementary). The number of levels of decomposition depends on the complexity of the problem: the more it's complex, the more the number of steps would be considerable.
This method of refining successive (also called top-down approach) allows a progressive movement with maximum chance of success, from the abstract description of the solution of problem (per a complex operation) to the algorithm that would allow its resolution. The algorithm is in the last level of refining when it contains only basic operations, elementary ones and the control structures.
We define a basic operation as being a known operation in algorithmic such as sorting an array, whereas, the elementary operation is a simple algorithmic one (e.g. assignment).
Thus, in the first level, the problem is decomposed into a set of basic operations, elementary ones and operations that can be decomposed, related by controlling structures. The number of levels depends on the complexity of the problem. Going down in levels, only decomposable operations are decomposed and the decomposition stops when we reach a level in which the constituents are only basic and elementary operations.
This approach prevents the learner to be drowning in the details at the outset and gradually reduces the complexity of the addressed problem. In addition to that, the learner can freely express its solution, without any influence or restriction, which favors the autonomy.
Our objective by this approach is to evaluate algorithmic solutions. However, the essential fallout is the learning by the learners of the decomposition. In fact, this is a bond-holder passage for the learner in the formulation of his solution.

VALIDATION OF THE SOLUTION

Recall that our objective is to reach a reliable evaluation for algorithmic solutions. Thus, when the learner has completed its decomposition problem that has been proposed, its solution is compared to those of the expert grouped into a plan of solutions.
A plan of solutions is a set of paths representing the different possible ways (solutions) for the one exercise. That can contain wrong and correct solutions. It is constituted by an expert and includes solutions judged pedagogically interesting.
This plan could suffer from an exhaustive problem of completeness of expected solutions. It was solved as the following, every unrecognized solution; its evaluation will remain pending until a human expert would add it to the plan of solutions. This progress in the plan of solutions guarantees an evaluation whatever the solution suggested by the learner is. Thus, by time the deferred evaluation will decrease to the benefit of the direct evaluation.

RECOGNITION OF SOLUTIONS

To measure the similarity between two solutions, it is necessary to establish a correspondence between their components. More specifically, the point is to find the best possible matching: one that put in

correspondence the components that are the most similar, the similarity of the components is being based on the features they have in common. A first important point of similarity measure we use in relation to existing measures is that is not only quantitative (evaluating the degree of similarity of two solutions) but also qualitative (explaining in what the solutions are similar and in what they are different).

A second important point of our measure is that it allows to define the relative importance of features, relative to each other and therefore to introduce knowledge in calculating similarity**.**

The matching method AMAS (Automatic Matching Algorithms Solutions)

To automate the comparison of the process of learning with those of the expert (plane solutions), and drawing on the works of Sorlin (2006) on the measurement of multi-labeled graphs, we propose a method for matching algorithmic solutions (Figure 1)

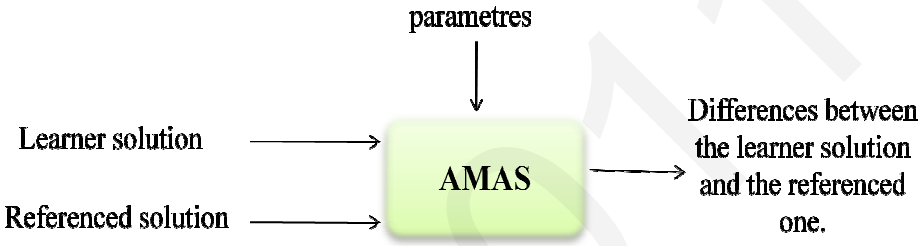

Figure 1: The matching method

This method involves comparing the solution of each learner with the expert solutions to measure the similarity between them. It is composed of two sequential steps (Figure 2):

1. Generate the description of the solution of the learner.
2. Measure the similarity between the solution of the learner and the solution referenced

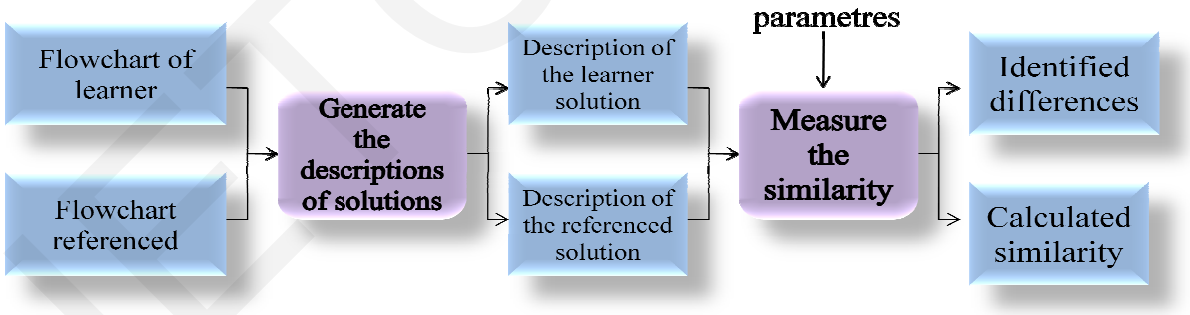

Figure 2: Steps of matching method AMAS.

ALGOBASE, A SYSTEM FOR ASSESSING ALGORITHMS

Our environment offers the learner a number of activities.

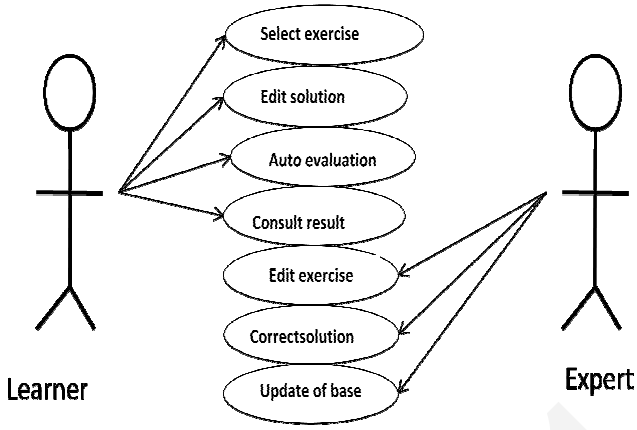

Figure 3 : Use case Diagram of AlgoBase

Starting by our objectives, we decided to distinguish two main actors in our system: the learner and the expert (teacher).

The expert's role is to manage the databases, making changes on the evolution of exercises and evaluate solutions when necessary.

The learner can consult existing exercises to select one. It can edit exercises in flowchart form. He is also invited to make self-assessments to confirm and read his annotations in the form of notes or summaries.

Both actors can access various activities throughout the environment

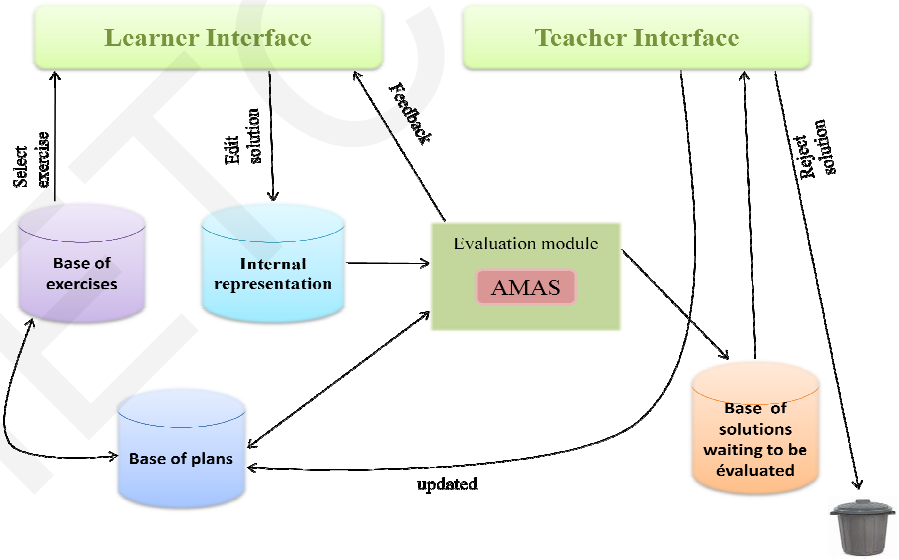

Figure 4 : Architecture of AlgoBase

Algobase editor of solutions.

This Editor offers the learner the opportunity to build its solution in flowchart form, it has at its disposal a library of operations and control structures.

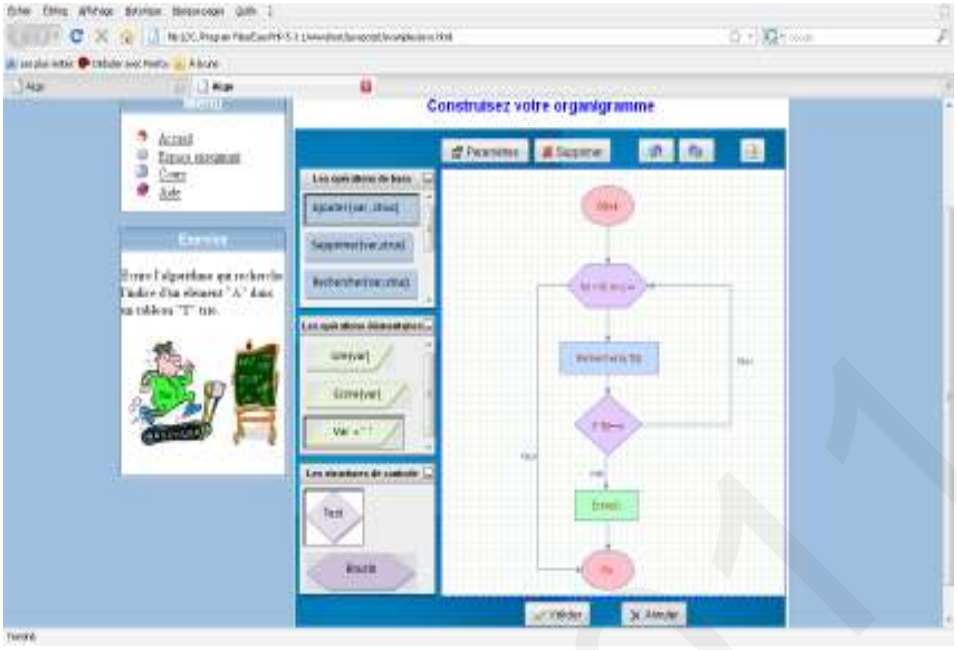

Figure 5 : interface of editor

CONCLUSION

The method of evaluation that we propose imposes, by its nature, to the learners to decompose his problem so that its solution is evaluated. This would *oblige* them to perform the decomposition.

This method is, in the other hand totally adequate for the field taught. As the result, it's trustful and not given in other suggested systems of evaluation of algorithmic, that are generally based on methods totally inadequate (MCQ...).

The feedback provided by the plan of solutions of a recognized solution is itself a source of learning. Thus, in addition to being summative, this evaluation is also formative.

Currently, a prototype is being tested with students from 2nd year LMD. The objective is to see after how much time the system acquires stability. By stability we mean reducing the maximum response of the human expert.

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An Analysis of Internet Addiction Levels of Individuals according to Various Variables

Cengiz ŞAHİN[1]

Abstract

The concept of internet addiction refers to the excessive use of internet which in turn causes various problems in individual, social and professional aspects. The aim of this study was to determine internet addiction levels of internet users from all age groups. The study used survey model. Study group of the study consisted of a total of 596 people from all age groups. "Personal Information Form" and "Internet Addiction Scale" were used for data collection. Arithmetic mean, standard deviation, independent sampling and t test, ANOVA and LSD tests were performed on collected data. The findings of the study revealed that the individuals had low levels of internet addiction both in sub-scales and in the general of the scale according to age groups. It was found that there was a significant difference between internet addiction scores of the individuals who belonged to the age group of 19 and below and 30 and below. There was a significant difference between the internet addiction scores of students and other professional groups. It was found that internet addiction levels of males were higher than those of females. The results of the study were discussed together with the results of different studies and suggestions were made.

Keyword: Internet, Addiction, Individual

INTRODUCTION

During the years of Cold War, United States of America supported all kinds of inventions to fulfill their military objectives. To achieve this aim, Advanced Research Projects Agency (ARPA) was established in 1958. Today's internet was developed as a result of long studies carried out in ARPA (Musch, 2000). The World Wide Web (WWW) was developed and began to be widespread in 1991 (Hecht, 2001). While number of wide band internet users in Turkey was 18.604 in 2003, it reached 8.7 million by the end of 2010 (Information Technology and Communication Institution, 2011).

Rapid development of computer technology in information society and particularly the invention and advancement of internet led to major changes in human life. Today, thanks to internet, it is possible to shop from virtual stores, to meet new people and make new friends via social networks, to easily access information and sources required for any subject or to be informed about any event that takes place anywhere in the world (Çalık, Çınar, 2009). In addition to many positive effects, it is possible to discuss negative effects of computers, particularly of internet on individuals and society (Çalık, Çınar, 2009; Khasawneh, Al-Awidi, 2008; Kelleci, 2008: Weiner, 1996). Internet addiction might be listed among these negative effects (Chou, Condron, Belland, 2005).

The concept of internet addiction, which was first used by Goldberg in 1995, has recently turned out to be a phenomena, which is tried to be defined through various terms such as "net addiction", "internet addiction", "on-line addiction", "internet addiction disorder", pathologic internet use" and "cyber disorder" (Eichenberg & Ott, 1999). Although there is not a standard definition for internet addiction yet (Chou, Condron, Belland, 2005) the most basic symptoms can be listed as inability to restrict internet use, to continue internet use despite social or academic hazards and feeling a deep anxiety when access to internet is restricted (Öztürk et al, 2007).

Internet addiction is not still defined as a disorder in "Diagnostic and Statistical Manual of Mental Disorders" (also known as "DSM-IV-TR") published by the American Psychological Association in 2000. It was suggested that pathological gambling disorder was viewed as most akin to internet addiction (Köroğlu, 2001; Öztürk et al., 2007). Young, who first introduced the definition of internet addiction and determined the first diagnosis criteria concluded that "pathological gambling" under the title of impulse control disorders in DSM IV was viewed as most akin to internet addiction. Internet addiction does not involve misuse of any substances (Greenfield, 1999: Cited by. Arısoy, 2009).

The concept of internet addiction refers to the excessive use of internet which in turn causes various problems in individual, social and professional aspects. In other words, the concept of internet addiction refers to experiencing various problems in individual, social and professional aspects due to excessive use

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of internet. Internet addiction recently began to be analyzed as a psychological problem in association with various psychological problems in the academic world. Particularly educators, psychological counselors, psychologists and psychiatrists tended to carry out various researches on internet addiction (Zimmerl, 1998; Eichenberg and Ott, 1999; Morahan-Martin and Schumacher, 2000; Young, 2006; Ayaroğlu, 2002; Bölükbaş, 2003; Orhan and Akkoyunlu, 2004; Cengizhan, 2005; Esen 2007; Turnalar Kurtaran, 2008). These studies generally investigated the relationship between excessive use of internet and loneliness, depression, having antisocial values and low emotional intelligence, the relationships with the family, particularly with mother and friends, playing online games, searching and shopping, depressive symptoms, decreased social interaction, psychological well-being of the individual, social, verbal and academic functions.

The literature contains only a limited number of studies which investigated internet addiction levels of different age groups. For this reason, this study aimed to determine internet addiction of internet users from different age groups and thus to produce concrete and applicable solutions to overcome this problem. It is believed that this study differed from other studies in the literature from these aspects.

The main problem of this study was to determine the levels of internet addiction which cause excessive use of internet by the individuals from different age groups and in turn leads to experiencing various problems in individual, social and professional aspects.

Aim of the Study

The aim of this study was to determine internet addiction levels of individuals from all age groups in terms of various variables. To achieve the aim of the study, the following questions were tried to be answered:

1. What are the internet addiction levels of the individuals?
2. Do internet addiction levels of the individuals vary according to age group?
3. Do internet addiction levels of the individuals vary according professional group?
4. Do internet addiction levels of the individuals vary according to gender?

METHOD

Study Model

This is a descriptive study which used survey model. As it is known, survey models aim to indicate an existing situation as they are (Karasar, 1999). In this framework, we tried to determine internet addiction levels of the individuals from all age groups.

Study Group

Population of the study consisted of the individuals living in Kırşehir province of Turkey. Among random sampling methods, simple random sampling method was used to determine the study group. Study group of the study consisted of a total of 596 individuals from different age groups living in Kırşehir city center. Of the individuals in the study group, 284 (47.7%) were male, 312 (52.3%) were female. As for the distribution of the study group according to age groups; a total of 109 (18.3%) belonged to the age group of 19 and below; 98 (16.4%) belonged to the age group of 20-29;155 (26.0%) belonged to the age group of 30-39; 141 (23.7%) belonged to the age group of 40-49; and 93 (15.6) belonged to the age group of 50 and above. As for the distribution of the participants according to professional status, it was found that 191 (32.0%) were students; 221 (37.1%) worked in various professions; 39 (6.5%) were unemployed; 119 (20.0%) were housewives and 26 (4.4%) were retired.

Study Instruments

"Personal Information Form" and "Internet Addiction Scale" were used for data collection.

Personal Information Form: This form consists of four questions on the data about the independent variables of the study.

Internet Addiction Scale (IAS): The scale, which was designed by Hahn and Jerusalem (2001), aims to determine internet addiction levels of the individuals. The original title of the scale is *"Skala zur Erfassung der Internetsucht"*. The scale was adapted into Turkish by Şahin and Korkmaz (2011).

The scale contains 19 items and 3 factors. The first factor is "Loss of Control-LC"; the second factor is "Tolerance Development-TD" and the third factor is "Negative Consequences for Social Relationships-NCSR"

Kaiser-Meyer-Oklin (KMO) and Bartlett test analyses were performed to test structural validity of the scale. KMO= 0,919; Bartlett test value was x2= 6087,383; sd=171 (p=0,000). It was found that the items within the scale concentrated on three factors and explained 68.095% of total variance. Confirmatory factor analyses showed that the model had an acceptable adaptation. To calculate discriminative power of items, the correlations between the scores obtained from each item and the scores obtained from the factors were calculated and it was found that each item had a significant and positive relationship with factor score. Internal consistency analyses were conducted to calculate internal consistency of the scale. Analyses revealed that internal consistency coefficients of the factors varied between 0.887 and 0.926 and that internal consistency coefficient for the general of the scale was 0.858.

Data Analysis and Interpretation

Each of the items in internet addiction scale was scaled as Never (1), Rarely (2) Sometimes (3), Generally (4) and Always (5). In parallel with the structure of the scale, for three sub-factors, averages of the response of the individuals to five-item Likert type scale were calculated severally. High averages indicate high level of internet addiction while low averages indicate low addiction levels. The scores obtained from the responses of the individuals to five-item Likert type scale did not show a standard character due to the differences in number of items in the sub-factors. For this reason, obtained raw scores were converted into standard scores (minimum 20; maximum 100).

The levels corresponding to the scores obtained from sub-scales can be summarized as follows: low internet addiction (20-51), mean internet addiction (52-67), high internet addiction (68-100).

In this framework, internet addiction levels of the individuals were analyzed using arithmetic mean, standard deviation, t test, ANOVA and LSD analyses. $p<.05$ level was considered as adequate for the significance between the factors.

FINDINGS

In this section, the findings of the study were presented and evaluated in tables.

1. Internet Addiction Levels of the Individuals

Table 1. Internet Addiction Levels of the Individuals

Variable	N	M	SD	Min	Max	Levels (f/%)					
						Low		Medium		High	
Loss of Control-LC	596	32,61	17,67	17,14	100,00	510	85,6	38	6,4	48	8,1
Tolerance Development-TD		32,84	17,92	20,00	100,00	511	85,7	46	7,7	39	6,5
Negative Consequences for Social Relationships-NCSR		27,01	14,01	17,50	100,00	538	90,3	43	7,2	15	2,5
Internet addiction (Total)		30,30	10,37	18,95	71,58	570	95,6	24	4,0	2	0,3

Table 1 indicates that the individuals in different age groups had a low level of internet addiction in sub-scales and in the general of the scale.

2. Internet Addiction Levels of the Individuals according to Age Groups

Table 2. Means, Standard deviations and Variance Analysis Results of the Internet Addiction Levels of the Individuals according to Age Groups

Age Groups	N	Loss of Control-LC		Tolerance Development-TD		Negative Consequences for Social Relationships-NCSR		Internet addiction (Total)	
		M	SD	M	SD	M	SD	M	SD
>19 age	109	47,31	22,85	31,74	17,46	26,67	14,48	35,35	10,26
20-29 age	98	33,24	17,27	34,69	18,91	29,26	14,78	31,87	10,10
30-39 age	155	28,02	12,70	31,45	17,38	25,32	11,59	27,61	9,33
40-49 age	141	29,99	15,53	34,36	18,67	26,33	13,64	29,37	10,35
50 < age	93	26,39	10,68	32,20	17,13	28,87	16,44	28,66	10,26
Genel Ortalama	596	32,62	17,67	32,84	17,92	27,01	14,01	30,30	10,36

Variable	Source of Variance	Square Total	Degree of Freedom	Mean Square	F	p	Significant difference (LSD)
Loss of Control-LC	Between groups	31436,163	4	7859,041	30,089	,000	the age group of 19 and below – other age groups
	Within groups	154366,330	591	261,195			
	Total	185802,493	595				

Tolerance Development-TD	Between groups	1130,806	4	282,702	,879	,476	--
	Within groups	189973,682	591	321,444			
	Total	191104,488	595				
Negative Consequences for Social Relationships-NCSR	Between groups	1337,159	4	334,290	1,710	,146	--
	Within groups	115538,040	591	195,496			
	Total	116875,199	595				
Internet addiction (Total)	Between groups	4513,296	4	1128,324	11,224	,000	the age group of 19 and below – other age groups
	Within groups	59410,652	591	100,526			
	Total	63923,947	595				

Data in Table 2 revealed that internet addiction levels of the individuals who belonged to the age group of 19 and below were higher than those of the individuals who belonged to the age group of 20 and over. An analysis was made to determine whether these differences were significant. The results showed that there was a significant difference between TD ($F(4-591)= .879$, $P>0.05$) and NCSC ($F(4-591)= 1.710$, $P>0.05$) scores. It was found that there was a significant difference between LC ($F(4-591)= 30.089$, $P<0.01$) and IA general total scores ($F(4-591)= 11.224$, $P<0.01$). LSD test was performed to determine the groups which caused difference. LSD test results revealed that there was a significant difference between the internet addiction scores of 19 and below age group and other age groups.

3. Internet Addiction Levels of the Individuals according to Professional Groups

Table 3. Means, Standard deviations and Variance Analysis Results of the Internet Addiction Levels of the Individuals according to Professional Groups

Professional Groups	**N**	Loss of Control-LC		Tolerance Development-TD		Negative Consequences for Social Relationships-NCSR		Internet addiction (Total)	
		M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Student	191	41,45	21,95	34,63	19,14	28,63	15,13	34,62	10,35
Worker	221	30,20	14,88	34,16	17,69	27,20	14,09	29,77	9,85
Unemployed	39	30,03	11,72	29,87	15,28	22,69	6,62	26,90	7,19
Housewife	119	25,06	10,65	29,62	17,49	25,88	13,99	26,36	10,15
Retired	26	26,70	10,34	27,69	13,13	25,00	11,61	26,19	8,31
Total	596	32,61	17,67	32,84	17,92	27,00	14,01	30,30	10,36

Variable	**Source of Variance**	**Square Total**	**Degree of Freedom**	**Mean Square**	**F**	**p**	**Significant difference (LSD)**
Loss of Control-LC	Between groups	24150,221	4	6037,555	22,073	,000	between the students and other professional groups
	Within groups	161652,272	591	273,523			
	Total	185802,493	595				
Tolerance Development-TD	Between groups	3266,126	4	816,532	2,569	,037	housewives, students and professional groups
	Within groups	187838,362	591	317,831			
	Total	191104,488	595				
Negative Consequences for Social Relationships-NCSR	Between groups	1498,583	4	374,646	1,919	,106	--
	Within groups	115376,616	591	195,223			
	Total	116875,199	595				
Internet addiction (Total)	Between groups	6353,119	4	1588,280	16,305	,000	between students and other professional groups
	Within groups	57570,829	591	97,413			
	Total	63923,947	595				

Table 3 indicated that internet addiction scores of the students were higher in terms of sub-scales and IA general when compared to other professional groups. An analysis was conducted to determine whether these observed differences were significant. Analysis results showed that the difference between NCSC($F(4-591)= 1.919$; $P>0.05$) scores of the individuals according to professional groups was not significant; while the difference among LC ($F(4-591)= 22.073$; $P<0.01$) and TD ($F(4-591)= 2.569$; $P<0.05$) and IA ($F(4-591)= 16.305$; $P<0.01$) total scores was significant. LSD test was performed to determine the groups which caused difference. LSD test results showed that there was a significant difference between the students and other professional groups in LC sub-dimension; among housewives, students and the individuals who were working in TD sub dimension; between students and other professional groups in IA general total.

4. Internet Addiction Levels of the Individuals according to Gender

Table 4. t Test Results according to Gender of the Individuals

Variable		N	M	SD	DF	t	p
Loss of Control-LC	Male	312	31,98	17,97	594	-,913	,362
	Female	284	33,31	17,33			
Tolerance Development-TD	Male	312	29,15	16,15	594-	5,396	,000
	Female	284	36,90	18,88			
Negative Consequences for Social Relationships-NCSR	Male	312	24,76	12,15	594	-4,148	,000
	Female	284	29,47	15,46			
Internet addiction (Total)	Male	312	28,35	9,95	594	-4,916	,000
	Female	284	32,45	10,39			

It was understood from Table 4 that internet addiction scores of males were higher from those of females in sub-scales (LC, TD and NCSC) and in the general of the scale. An analysis was performed to determine whether these observed differences were significant. Analysis results showed that the difference between internet addiction scores of males and females according to LC subscale was not significant (t(594)=-.913; P>0.05); DFO (t(594)= -5.396),. However, it was found that the difference between internet addiction scores of males and females according to TD (t(594)= -5.396), NCSC (t(594)=-4.148) sub scales and IA general total (t(395)=-4,916) was significant

RESULT AND DISCUSSION

It was found that the individuals had low level of internet addiction in sub-scales and in general of the scale according to age groups. This finding is consistent with literature data. The literature contains various studies carried out in different societies which reported significantly low number of individuals with internet addiction (Saville et al., 2010; Chaw, Black, 2008). Similar studies found that the majority of the individuals had a low level of internet addiction (Niesing, 2001; Hahn and Jerusalem, 2001).

It was found that internet addiction levels of 19 and below age group was high. It was observed that there was a significant difference between internet addiction scores of the individuals who belonged to the age group of 19 and below and 30 and below. Similarly, Choi et al., (2008) reported that internet addiction was more common among young people, and for this reason, young people should be permanently monitored. Öztürk et al., (2007) reported that internet addiction turned out to be a serious risk factor particularly for 12-18 age group. Hahn and Jerusalem (2001) reported that the individuals belonging to the age group of 20-29 used internet more, while internet addiction scores of the individuals belonging to the group of 19 and below was higher than other groups and that this situation varied according to gender.

It was found that there was a significant difference between internet addiction scores of the students and other professional groups. The study of Seville et al, (2010) conducted on high school students reported that internet addiction of the students who recently started high school was higher than that of other students. Sunny et al., (1999) reported similar results.

Internet addiction levels of males were found to be higher than those of females. These findings are supported by the findings of various studies in the literature. In a study carried out by Choi et al., (2008) it was reported that the case of internet addiction was more common in male students when compared to female students. Karaman and Kurtoğlu (2009) found that male pre-service teachers were more addicted to internet than female pre-service teachers. Hahn and Jerusalem (2001) reported that males used internet more when compared to females; however internet use levels of females increased in years.

This study is limited in two respects. It aimed to determine internet anxiety levels of the individuals in different age groups living in Kırşehir city of Turkey and analyzed whether certain variables were effective on internet addiction. For this reason, analysis of larger groups will facilitate making generalizations.

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AN INTERNATIONAL DIMENSION OF THE STUDENT'S ATTITUDES TOWARDS THE USE OF ENGLISH IN WEB 2.0 TECHNOLOGY

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ABSTRACT
Web 2.0 changed the way people used Web in the field of education and especially in foreign language learning.Since its emergence in 2004, it has gained great attention of teenagers and university students. Educators regard Web 2.0. as a language learning/teaching tool. According to International Federation of Accounts(IFAC)report 2000 and beyond(1996)it has been informed that a key goal of accounting programs should be to teach students to learn on their own. The purpose of this research was to determine undergraduate and high school students' attitudes towards the use of English in Web. 2.O technologies. This study was mainly based on quantitative design that involved 534 students out of randomly selected 550 participants from 6 different universities and 3 high schools in Turkey and Iraq . The potential of Web 2.0 was determined as creating formal and informal learning environments.Within the context of the study, the students' attitudes were revealed and recommendations were developed for language teachers and educators. It has been found that Web 2.0 technologies serve as a good learning tool in which the learners find the opportunity to practice language in a real-like atmosphere: **the new medium**.

Key Words: Web 2.0 technologies, foreign language learning, English language teaching.

INTRODUCTION

English, "by far the most widely used of all living languages", is taught as foreign language at schools of most nations (Broughton, Brumfit & Brumfit, Flavell, Hill, Pincas, 2003), but it has been recently accepted that language students have started using communication tools via English. This attempt starting with CALL continues to be popular with Web 2.0 nowadays. The increasing popularity of Web 2.0 technologies in almost every field of daily and academic life has promoted researchers to consider whether and to what extent such educational tools can be benefitted from. The study conducted by İşman (2008) proves that the improvements in communication tools have had a direct influence upon education. Web 2.0 can be defined as Web based applications and services that provide users visual, textual, audial communication, interactive information, shared content, collaboration, authenticity and digital literacy (Haythorthwaite & Kazme 2004; O' Reilly, 2005; Giustini, 2006; Maness, 2006; Miller, 2006; Price, 2006; Richardson, 2006; Mcloughlin & Lee, 2007; Lankshear & Knobel 2007; Boyd & Ellison, 2008; Thomas, 2009; Motteram & Sharma, 2009). The types of Web 2.0 used in education include "blogs (Facebook, Twitter etc.), wikis, multimedia sharing services, content syndication, podcasting and content tagging services" (Anderson, 2007). Particularly in foreign language learning, many researchers have shown that Web 2.0 can be utilized as an effective educational tool since it enables a variety of collaboration, communication and interaction (Fullan, 1993; Pica, 1997; Jonassen, Peck and Wilson, 1999; Lee, 2005; Munoz, 2009, Warschauer, Shetzer, & Meloni, 2000; Sykes, Oskoz & Thorne, 2008; Kayri & Çakır, 2010). In addition to being collaborative, interactive and communicative tool in education, Web 2.0 also has an undeniable effect on the enhancement of writing skills for learners (Mason & Rennie, 2008, Vijayakumar, 2011). The more there is an emphasis on learner autonomy, the more Web 2.0 tools have gained significance by enabling facilities for independency (Crook, 2008, Cooker, 2010). Moreover, the study conducted by Lam (2000) revealed that Web 2.0 tools increased the motivation of learners. However, these tools may be disruptive if they aren't implemented carefully into classroom practice (Godwin-Jones, 2005, Mason & Rennie, 2008). On the contrary, they might be more disadvantageous because of exploitation, lack of confidence, privacy and control (Merchant, 2001; Livingstone, 2002; Patchin and Hinduja, 2010). The importance of Web 2.0 tools in education have been emphasized a lot in most studies. Even if there are few studies (Chun and Plass, 1996 ; Warscahauer and Kern, 2000) exploring the practices of

Web 2.0 tools in foreign language education, there is almost no study focusing on students' perceptions upon the use of Web 2.0 tools in foreign language learning, though. Hence, this study tries to reveal the most recent perceptions and implications by investigating the roles of Web 2.0 tools in foreign language education. Furthermore, it gives some clues about how to make the efficient use of Web 2.0 tools by providing some practical implications for teacher education and training. In order to achieve these aims, the following are the research questions of the study:

1. What are the perceptions of foreign language learners in using Web 2.0 technologies?
2. Do students regard Web 2.0 as an opportunity for English language learning?
3. Do socio-cultural differences affect the students' views about the use of Web 2.0 in foreign language learning?
4. Can the use of Web 2.0 contribute significantly to English language learning?

METHOD

In this study, a descriptive analysis was carried out. After the analysis of the questionnaires, semi-structured and focus group interviews were made.Ten students were chosen randomly from the institutions located in Turkey.The questionnairre allowed gathering information about students' perceptions of themselves in using English regarding the following items: using blocks,use of a different language except English,writing status messages, sharing videos, sharing writings, joining groups,creating groups, joining groups to learn English, playing games, learning vocabulary through games, using applications, linking to fun pages, commenting on photos, commenting on videos, commenting on status messages, making foreign friends, chatting on line, feeling confedence in courses,enhancing vocabulary knowledge,enhancing speaking skill, enhancing listening skill,enhancing reading skill, enhancing writing skill,using to learn vocabulary, wasting time on internet. The cronbach's alpha reliability factor of the pilot study was found to be .82 in the first application.Additionally, it was calculated as .89 in the second pilot study, that is quite reliable and valid for Likert-type attitude scales (Nunan, 1997). The items in the questionnaire were analysed using the Statistical Package for Social Sciences (SPSS). For every item, frequencies and percentages were calculated. Chi-square tests were applied in order to find the significance of the distribution of the answers.

SETTING AND PARTICIPANTS

The study was conducted at Adıyaman University(N=50, M=17, F=33, A=19-27), Gaziantep University (N=47, M=33, F=14, A=18-24), İnönü University (N=50, M=29, F=23, A=18-25), Erbil Ishik University at which students' mother tongues are Kurdish and Arabic (N=50, M=27, F=23, A=18-20), Gazikent University(N=50, M=32, F=18, A=18-24), Zirve University(N=30, M=17 ,F=13 ,A=18-21), Besni Vocational High School(N=50, M=18, F=32, A=17-35), Sabahattin Zaim Social Sciences High School(N=40, M=17, F=23, A=17), Ishik Hawler Secondary School in which students' native languages are Kurdish and Arabic (N=50, M=50, A=13-16) and Barak Primary School(N=54, M=26, F=28, A=13-14). The participants were placed at appropriate levels from beginner to pre-intermediate level at the beginning of the academic year. The age of the participants vary from 13 to 35 years old.228 of the participants were female and 293 were male at total. For the identification of interview participants, criterion sampling was used (Patton, 1990).

FINDINGS AND RESULTS

In Table 1. to analyze the data frequencies, percentages, means, standard deviations and chi-square results were employed. It was observed that the mean score of Gazikent University was the highest when compared with Adıyaman University and Gaziantep University .The socio-economical level of private university students' are higher than the government institutions. These findings were parallel to the data in Barak Primary School and Sabahattin Zaim Primary School when compared with private institutions at the same level. Chi-square results show that learning is increased by use of technology. All of the findings were similar except the college in Iraq which indicates the importance of culture. This preference is related with their family background and strict rules in schools. These findings suggest that one of the main role of the EFL teacher is to motivate the learners to use English in different contexts.

The analyses of the first question that is about using Web 2.0 tools shows that in high schools over half of the students "usually" or "always" use Web 2.0 tools on internet. The results are similar when compared with the universities while % 15 of the all university students "never" or "seldom" use Web.2.0 tools. Technology-

driven tools help learners to guide their own learning process. The analyses of the second, third, thirteenth, fourteenth and fifteenth items that are related to students' producing language on internet, 47 % of university

Table1. Items Related to the Use of Web 2.0 Tools

	Adıyaman (100)												Gaziantep University (50)												Inönü University (100)											
	Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always			
	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²
1	11	11	5	5	19	19	23	23	42	42	3,80	1,33	40,00	6	12	2	4	4	8	22	44	13	26	3,72	1,28	28,43	14	14	9	9	16	16	33	33	28	28	3,52	1,36	20,30
2	12	12	5	5	20	20	24	24	39	39	3,73	1,35	33,30	12	24	2	4	2	4	15	30	16	32	3,45	1,61	20,34	18	18	5	5	3	3	22	22	52	52	3,85	1,54	77,30
3	68	68	13	13	18	18	1	1	0	0	1,52	0,82	155,90	18	36	12	24	14	28	2	4	1	2	2,06	1,03	24,17	64	64	13	13	20	20	3	3	0	0	1,62	0,91	133,70
4	48	48	22	22	27	27	3	3	0	0	1,85	0,93	76,30	12	24	10	20	18	36	7	14	0	0	2,43	1,04	18,64	38	38	24	24	23	23	12	12	3	3	2,18	1,16	35,10
5	59	59	20	20	13	13	6	6	2	2	1,72	1,04	104,50	14	28	13	26	13	26	6	12	1	2	2,30	1,10	13,74	48	48	20	20	25	25	6	6	1	1	1,92	1,03	68,30
6	73	73	11	11	11	11	2	2	3	3	1,51	0,98	179,20	22	44	9	18	6	12	8	16	2	4	2,13	1,30	24,17	66	66	8	8	9	9	14	14	3	3	1,80	1,25	135,30
7	91	91	3	3	3	3	3	3	0	0	1,18	0,63	315,40	43	86	3	6	0	0	1	2	0	0	1,13	0,49	150,77	93	93	2	2	3	3	0	0	2	2	1,16	0,66	333,30
8	66	66	13	13	11	11	6	6	4	4	1,69	1,13	134,90	22	44	11	22	6	12	5	10	3	6	2,06	1,28	24,81	67	67	7	7	11	11	9	9	6	6	1,80	1,29	138,80
9	44	44	11	11	22	22	15	15	8	8	2,32	1,38	41,50	18	36	13	26	9	18	6	12	1	2	2,13	1,13	18,00	58	58	11	11	16	16	11	11	4	4	1,92	1,24	93,90
10	37	37	17	17	27	27	15	15	4	4	2,32	1,23	31,40	21	42	12	24	10	20	4	8	0	0	1,94	1,01	27,57	46	46	17	17	17	17	17	17	3	3	2,14	1,26	49,60
11	54	54	14	14	25	25	6	6	1	1	1,86	1,05	88,70	22	44	10	20	9	18	3	6	3	6	2,04	1,23	25,66	51	51	16	16	21	21	10	10	2	2	1,96	1,15	70,10
12	47	47	19	19	23	23	8	8	3	3	2,01	1,14	58,60	13	26	12	24	14	28	7	14	1	2	2,38	1,11	12,47	41	41	23	23	19	19	12	12	5	5	2,17	1,23	37,00
13	66	66	18	18	15	15	0	0	1	1	1,52	0,82	145,30	19	38	14	28	12	24	2	4	0	0	1,94	0,92	28,00	59	59	17	17	19	19	5	5	0	0	1,70	0,95	107,80
14	71	71	17	17	9	9	2	2	1	1	1,45	0,82	170,80	20	40	13	26	12	24	1	2	1	2	1,94	0,99	29,06	68	68	14	14	17	17	1	1	0	0	1,51	0,81	155,50
15	75	75	11	11	11	11	2	2	1	1	1,43	0,84	193,60	19	38	16	32	10	20	1	2	1	2	1,91	0,95	29,49	63	63	18	18	15	15	4	4	0	0	1,60	0,89	126,70
16	50	50	21	21	15	15	9	9	4	4	1,95	1,18	65,80	16	32	11	22	7	14	9	18	3	6	2,39	1,32	10,09	50	50	17	17	20	20	3	3	9	9	2,03	1,29	66,61
17	51	51	17	17	14	14	12	12	6	6	2,05	1,30	63,30	18	36	9	18	8	16	9	18	3	6	2,36	1,34	12,47	55	56	19	20	10	10	10	11	6	6	1,93	1,27	81,10
18	62	62	16	16	14	14	6	6	2	2	1,70	1,05	116,80	20	40	12	24	10	20	5	10	0	0	2,00	1,04	24,17	61	61	13	13	17	17	5	5	4	4	1,78	1,14	111,00
19	33	33	25	25	24	24	14	14	3	3	2,28	1,16	27,01	14	28	10	20	15	30	7	14	0	0	2,33	1,08	15,96	38	38	20	20	18	18	16	16	8	8	2,36	1,34	24,40
20	37	37	19	19	28	28	10	10	6	6	2,29	1,23	32,50	19	38	12	24	7	14	6	12	3	6	2,19	1,28	16,72	43	43	24	24	15	15	10	10	8	8	2,16	1,30	40,70
21	34	34	30	30	18	18	14	14	4	4	2,24	1,18	29,60	13	26	12	24	12	24	7	14	3	6	2,47	1,23	7,79 *	44	44	24	24	16	16	13	13	3	3	2,07	1,18	47,30
22	39	39	24	24	17	17	14	14	6	6	2,24	1,27	30,90	14	28	12	24	12	24	9	18	0	0	2,34	1,11	13,11	40	40	26	26	16	16	13	13	5	5	2,17	1,23	36,30
23	44	44	26	26	15	15	9	9	6	6	2,07	1,22	47,70	15	30	8	16	12	24	9	18	3	6	2,51	1,30	8,64 *	40	40	24	24	20	20	12	12	4	4	2,16	1,20	36,80
24	53	53	26	26	15	15	5	5	1	1	1,75	0,96	86,80	24	48	16	32	5	10	2	4	0	0	1,68	0,84	44,60	60	60	13	13	23	23	3	3	1	1	1,72	0,99	115,40
25	20	20	8	8	38	38	13	13	21	21	3,07	1,37	25,90	12	24	5	10	17	34	7	14	6	12	2,79	1,33	10,77	17	17	28	28	22	22	16	16	17	17	2,88	1,34	5,10 *
	Gazikent University (50)												Zirve University (50)												Işık University/Iraq (50)											
	Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always			
	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²
1	2	4	8	16	17	34	19	38	4	8	3,30	0,97	23,40	1	3	2	7	8	27	13	43	6	20	3,70	0,99	15,67	10	20	9	18	17	34	7	14	7	14	2,84	1,30	6,80
2	1	2	11	22	15	30	17	34	6	12	3,32	1,02	17,20	4	13	1	3	3	10	12	40	10	33	3,77	1,33	15,00	23	46	8	16	7	14	6	12	6	12	2,28	1,46	21,40
3	1	2	8	16	15	30	18	36	8	16	3,48	1,01	17,80	7	23	8	27	14	47	1	3	0	0	2,30	0,88	21,67	20	40	6	12	13	26	6	12	5	10	2,40	1,39	16,60
4	0	0	7	14	16	32	18	36	9	18	3,58	0,95	21,00	3	10	9	30	14	47	4	13	0	0	2,63	0,85	20,33	21	42	12	24	8	16	6	12	3	6	2,16	1,27	19,40
5	5	10	6	12	14	28	15	30	10	20	3,38	1,23	8,20 *	7	23	12	40	9	30	2	7	0	0	2,20	0,89	16,33	27	54	7	14	8	16	5	10	3	6	2,00	1,29	37,60
6	1	2	5	10	11	22	14	28	19	38	3,90	1,09	20,40	13	43	5	17	9	30	1	3	2	7	2,13	1,22	16,67	31	62	5	10	5	10	4	8	5	10	1,94	1,41	55,20
7	3	6	4	8	13	26	25	50	5	10	3,50	0,99	34,40	27	90	1	3	2	7	0	0	0	0	1,17	0,53	92,33	28	56	8	16	4	8	6	12	4	8	2,00	1,37	41,60
8	2	4	11	22	14	28	15	30	8	16	3,32	1,11	11,00	15	50	4	13	3	10	6	20	2	7	2,20	1,42	18,33	29	58	9	18	9	18	2	4	1	2	1,74	1,03	50,80
9	6	12	8	16	15	30	12	24	9	18	3,20	1,26	5,00 *	13	43	6	20	3	10	5	17	3	10	2,30	1,44	11,33	35	70	6	12	6	12	1	2	2	4	1,58	1,05	80,20
10	0	0	5	10	16	32	21	42	8	16	3,64	0,88	28,60	15	50	5	17	6	20	3	10	1	3	2,00	1,20	19,33	29	58	5	10	7	14	4	8	5	10	2,02	1,41	45,60
11	3	6	3	6	8	16	17	34	19	38	3,92	1,16	23,20	9	30	9	30	8	27	3	10	1	3	2,27	1,11	9,33 *	22	44	9	18	7	14	5	10	7	14	2,32	1,48	18,80
12	2	4	10	20	11	22	13	26	14	28	3,54	1,22	9,00 *	7	23	9	30	7	23	6	20	1	3	2,50	1,17	6,00 *	21	42	10	20	7	14	6	12	6	12	2,32	1,43	16,20
13	5	10	7	14	14	28	20	40	4	8	3,22	1,11	18,60	6	20	5	17	12	40	7	23	0	0	2,67	1,06	12,33	24	48	6	12	10	20	4	8	6	12	2,24	1,44	26,40
14	2	4	11	22	10	20	17	34	10	20	3,44	1,16	11,40	7	23	7	23	11	37	5	17	0	0	2,47	1,04	10,67	24	48	11	22	6	12	4	8	5	10	2,10	1,36	27,40
15	1	2	5	10	14	28	22	44	8	16	3,62	0,95	27,00	7	23	8	27	11	37	4	13	0	0	2,40	1,00	11,67	22	44	4	8	11	22	2	4	11	22	2,52	1,61	24,60
16	5	10	17	34	17	34	9	18	2	4	2,72	1,01	18,80	7	23	5	17	8	27	4	13	6	20	2,90	1,45	1,67 *	20	40	11	22	10	20	6	12	3	6	2,22	1,27	16,60
17	0	0	4	8	10	20	19	38	17	34	3,98	0,94	26,60	6	20	10	33	5	17	7	23	2	7	2,63	1,25	5,67 *	19	38	7	14	11	22	11	22	2	4	2,40	1,31	15,60
18	2	4	10	20	27	54	8	16	3	6	3,00	0,88	40,60	7	23	11	37	5	17	6	20	1	3	2,43	1,17	8,67 *	24	48	9	18	9	18	6	12	2	4	2,06	1,24	27,80
19	3	6	10	20	17	34	15	30	5	10	3,18	1,06	14,80	6	20	9	30	6	20	8	27	1	3	2,63	1,19	6,33 *	21	42	10	20	12	24	6	12	1	2	2,12	1,15	22,20
20	2	4	7	14	17	34	14	28	10	20	3,46	1,09	13,80	6	20	12	40	7	23	3	10	2	7	2,43	1,14	10,33	15	30	10	20	12	24	9	18	4	8	2,54	1,31	6,60 *
21	5	10	6	12	15	30	10	20	14	28	3,44	1,30	8,20 *	7	23	10	33	9	30	2	7	2	7	2,40	1,13	9,67	14	28	9	18	16	32	9	18	2	4	2,52	1,20	11,80
22	1	2	13	26	15	30	14	28	7	14	3,26	1,07	14,00	6	20	8	27	9	30	5	17	2	7	2,63	1,19	5,00 *	17	34	7	14	12	24	9	18	5	10	2,56	1,39	8,80 *
23	1	2	9	18	17	34	16	32	7	14	3,38	1,01	17,60	4	13	11	37	9	30	4	13	2	7	2,63	1,10	9,67	13	26	6	12	18	36	10	20	3	6	2,68	1,24	13,80
24	6	12	6	12	18	36	11	22	9	18	3,22	1,23	9,80	19	63	9	30	2	7	0	0	0	0	1,43	0,63	44,33	18	36	11	22	8	16	8	16	5	10	2,42	1,39	9,80
25	2	4	5	10	22	44	16	32	5	10	3,34	0,94	29,40	0	0	4	13	6	20	15	50	5	17	3,70	0,92	20,33	17	34	5	10	14	28	7	14	7	14	2,64	1,44	10,80
	Barak Primary School (54)												Sabahattin Zaim Primary School (40)												Işık College/Iraq (50)											
tem	Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always				Never		Seldom		Sometimes		Usually		Always			
	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²	f	%	f	%	f	%	f	%	f	%	Mean	Std	x²
1	18	33	4	7	10	19	6	11	16	30	2,96	1,66	13,78	4	10	5	13	8	20	11	28	12	30	3,55	1,32	6,25	6	12	6	12	16	32	10	20	12	24	3,32	1,30	7,20 *
2	15	28	20	37	4	7	8	15	5	9	2,38	1,32	18,19	4	10	0	0	1	3	7	18	28	70	4,38	1,23	66,25	34	68	5	10	8	16	0	0	3	6	1,66	1,14	75,40
3	45	83	2	4	7	13	0	0	0	0	1,30	0,69	138,41	27	68	10	25	3	8	0	0	0	0	1,40	0,63	64,75	7	14	7	14	12	24	11	22	13	26	3,32	1,38	3,20 *
4	36	67	7	13	5	9	3	6	2	4	1,64	1,11	77,47	24	60	9	23	6	15	0	0	1	3	1,63	0,93	46,75	20	40	2	4	10	20	13	26	5	10	2,62	1,48	19,80
5	40	74	5	9	6	11	0	0	3	6	1,54	1,08	100,63	28	70	10	25	2	5	0	0	0	0	1,35	0,58	71,00	22	44	8	16	10	20	4	8	6	12	2,28	1,41	20,00
6	46	85	2	4	4	7	1	2	1	2	1,31	0,84	143,96	22	55	7	18	6	15	5	13	0	0	1,85	1,10	34,25	17	34	7	14	9	18	11	22	6	12	2,64	1,45	7,60 *
7	49	91	0	0	2	4	2	4	1	2	1,26	0,85	169,15	39	98	1	3	0	0	0	0	0	0	1,03	0,16	150,25	16	32	8	16	11	22	4	8	11	22	2,72	1,54	7,80 *
8	51	94	1	2	2	4	0	0	0	0	1,09	0,40	187,30	33	83	5	13	2	5	0	0	0	0	1,23	0,53	99,75	20	40	10	20	6	12	4	8	10	20	2,48	1,57	15,20
9	27	50	7	13	9	17	3	6	8	15	2,22	1,49	32,30	15	38	6	15	10	25	2	5	7	18	2,50	1,48	11,75	20	40	4	8	8	16	8	16	10	20	2,68	1,61	14,40
10	34	63	7	13	7	13	4	7	2	4	1,76	1,16	63,96	19	48	10	25	1	3	5	13	5	13	2,18	1,47	24,00	12	24	7	14	7	14	10	20	14	28	3,14	1,57	3,80 *
11	41	76	5	9	4	7	1	2	3	6	1,52	1,09	106,37	25	63	8	20	4	10	2	5	1	3	1,65	1,03	48,75	4	8	11	22	22	44	6	12	7	14	3,02	1,12	20,60
12	41	76	3	6	5	9	2	4	1	2	1,44	0,96	113,38	25	63	5	13	4	10	3	8	3	8	1,85	1,31	45,50	7	14	8	16	16	32	7	14	12	24	3,18	1,35	6,20 *
13	44	81	4	7	3	6	2	4	1	2	1,37	0,90	128,04	22	55	6	15	2	5	5	13	5	13	2,13	1,51	31,75	6	12	6	12	11	22	14	28	13	26	3,44	1,33	5,80 *
14	44	81	6	11	2	4	1	2	1	2	1,31	0,80	129,15	23	58	3	8	1	3	10	25	3	8	2,18	1,52	41,00	17	34	5	10	11	22	6	12	11	22	2,78	1,57	9,20 *
15	46	85	3	6	5	9	0	0	0	0	1,24	0,61	145,07	22	55	7	18	1	3	7	18	3	8	2,05	1,41	34,00	3	6	7	14	9	18	12	24	19	38	3,74	1,27	14,40
16	33	61	7	13	8	15	5	9	1	2	1,78	1,13	59,70	21	53	6	15	2	5	7	18	4	10	2,18	1,48	28,25	12	24	8	16	11	22	9	18	10	20	2,94	1,46	1,00 *
17	33	61	11	20	6	11	1	2	3	6	1,70	1,11	62,30	19	48	10	25	1	3	5	13	5	13	2,18	1,47	24,00	2	4	2	4	8	16	12	24	26	52	4,16	1,09	39,20
18	42	78	7	13	3	6	0	0	2	4	1,39	0,90	115,07	20	50	5	13	10	25	0	0	5	13	2,13	1,38	28,75	25	50	5	10	6	12	5	10	9	18	2,36	1,60	29,20
19	44	81	3	6	5	9	2	4	0	0	1,35	0,80	128,78	19	48	1	3	10	25	5	13	5	13	2,40	1,50	24,00	7	14	4	8	16	32	7	14	16	32	3,42	1,39	12,60
20	38	70	8	15	2	4	4	7	2	4	1,59	1,11	87,85	20	50	10	25	5	13	4	10	1	3	1,90	1,13	27,75	8	16	4	8	7	14	13	26	18	36	3,58	1,46	12,20
21	34	63	9	17	7	13	2	4	2	4	1,69	1,08	65,81	22	55	8	20	5	13	5	13	0	0	1,83	1,08	34,75	5	10	3	6	11	22	12	24	19	38	3,74	1,31	16,00
22	34	63	9	17	7	13	2	4	2	4	1,69	1,08	65,81	23	58	7	18	4	10	6	15	0	0	1,83	1,13	38,75	6	12	4	8	11	22	7	14	22	44	3,70	1,42	20,60
23	41	76	6	11	3	6	4	7	0	0	1,44	0,90	107,30	25	63	5	13	5	13	5	13	0	0	1,75	1,10	47,50	5	10	4	8	10	20	7	14	24	48	3,82	1,38	26,60
24	38	70	5	9	7	13	2	4	2	4	1,61	1,09	87,30	27	68	3	8	4	10	1	3	5	13	1,85	1,42	57,50	12	24	5	10	12	24	6	12	15	30	3,14	1,55	7,40 *
25	29	54	8	15	7	13	3	6	7	13	2,09	1,44	39,70	22	55	8	20	3	8	4	10	3	8	1,95	1,32	32,75	19	38	3	6	16	32	5	10	7	14	2,56	1,45	20,00

Note : x^2= Chi-Square * $p < .05$

students "usually" or "always" prefer commenting on photos, videos and status messages and using their

native language in writing while only 74 % of high school students "never" or "seldom" prefer doing these. The process of globalization is important in educational, political, cultural, economic and environmental aspects makes learning English a vital need. The fourth, fifth, sixth, seventh, eighth and sixteenth items that are sharing videos, writings, joining and creating groups and joining groups to learn English and making foreign friends on internet can be categorized as active participation of students. 49 % of all the university and high school students "never" or "seldom" use applications on the internet actively while a small portion of them "usually" or "always" prefer it. Learning is increased by use of technology. Through Web 2.0 tools foreign language learners develop motivation and increase the amount of national knowledge. (Clauss-Ehlers 2006) As for the activities on the internet entertaining the students, the results of the ninth, eleventh, twelfth, seventeenth and twenty- fifth items that are related to it show that 39 % of all the students "never" or "seldom" play games, like fan pages, chat online and waste their time on internet while over half of the students "usually" or "always" entertain themselves on internet. Web 2.0 tools are effective on the performance of foreign language learners. (Pegrum, 2009) For the activities students do for improving themselves, the analysis of the tenth, eighteenth, nineteenth, twentieth, twenty-first, twenty-second, twenty-third and twenty-forth items about learning vocabulary through games, feeling confident in courses, enhancing vocabulary knowledge and skills of speaking, listening, reading and writing, and using internet to learn vocabulary, 60 % of all the students "never" or "seldom" use applications to improve themselves while only 25 % of the students benefit from it. The way the language is grammatically and meaningfully constructed can shape the way people think and use the language in certain contexts. (Deutscher, 2010; Halvorsen, 2009)

DISCUSSION

While there are several studies in the literature indicating that Web 2.0 tools have a good impact on education, most all of these studies had limitations such as being held in one specific area, having only teachers' perspectives and not designed specifically for language education. Thus, conducting a study in public and private institutions in Turkey and Iraq would help us to answer some questions about the extent of applicability of Web 2 tools in language education in various socio-cultural environments.During the interviews conducted in Turkey, all the participants reported that they were familiar with the use of Web 2.0 tools. The results of both questionnaire and the interviews revealed that the need of the students will increase towards technology and English.

Results show that there are differences in students' perceptions about using Web 2.0 tools in language learning. No matter how various perceptions students have, the most important thing that may affect their perceptions is the implementation of these tools into classroom. Therefore, deficiencies in practice may hinder the beneficial wash back. There might be a lot of reasons for it. First of all, lack of awareness in both teachers and students reduces the efficacy of Web 2.0 tools. That students regard Web 2.0 tools as beyond game and free time activity could only be possible when teachers and students value Web 2.0 tools in foreign language education. However, when the classroom practices are evaluated, it can be easily said that the role of Web 2.0 tools has been underestimated. A recent and dramatic example of that is Dynet which is a Web-based program developed to teach English. But, English language teachers regard it time consuming and a big burden. As well as awareness, teachers need a good background knowledge about these tools to implement it effectively, which raises the question whether English language teaching departments provide good basis in teachers' education and technology courses fulfill theoretical and practical needs for application. It can be concluded that if teachers were educated in the field, the use of Web 2.0 could contribute significantly to English language learning .Thus, regarding Web2.0 tools as an opportunity for English Language learning will be inevitable for the learners of the 21st century: **the new medium**.

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ANALYSIS OF INTERNET ACCESS AMONG YOUTH IN KLANG VALLEY MALAYSIA

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ABSTRACT

This study is purposely conducted due to find out the internet access activity among teenagers within Klang Valley, Malaysia.The main focus is on teenagers aged between 12 to 25 years old around Klang Valley, which is located between Kuala Lumpur and Petaling Jaya. This empirical research is done due to acquire a current and flexible data that can directly adapt to the research problem. 400 sets of questionnaires have been distributed to respondents around Klang Valley within March to June 2006. The discussion of research analysis are classified into two main features comprises of respondents' background and educational level analysis and also Internet usage analysis. Within respondents' background and educational level analysis, the analysis focuses on respondents' age, gender and their highest educational level. Whilst for Internet usage analysis, the Internet usage level among respondents comprises of Internet usage frequency, preferable activity when surfing Internet, most used search engine and also obsession to advertisements are briefly analyzed.

Keywords : Internet, Internet Access Analaysis

INTRODUCTION

The emergence of Internet in Malaysia roused in 1990 when Malaysian Institute of Microelectronic Systems (MIMOS Berhad) has launched Joint Advanced Integrated Networking (JARING) as a pioneer in an Internet access provider or normally known as Internet Service Provider (ISP). Dr. Mohamed Awang-Lah, is the person responsible in introducing and implementing, hence developing JARING, also acts as a Deputy President of MIMOS Berhad at that moment. Dr. Mohamed Awang-Lah says that Internet in Malaysia started at Faculty of Electrical/Electronic Engineering, University of Malaya where he, himself has taught and conducted experiment with BSD Unix System. When he joint MIMOS, part of government entity, he has developed a small computer network known as RangKom under Malaysia's Fifth Plan (1986 – 1990). RangKom provides four dialup lines to Australia, United States of America, Netherlands and Korea. This JARING Project has been launched as a continuity of RangKom that promoting information exchange and database development through internet access. JARING is connected to Internet via satellite installation between Malaysia and United States of America in 1992, hence providing access to Internet over 140 countries for its users in Malaysia. In July 1996, Malaysia's' second ISP has been launched by Telekom Malaysia, formerly known as TMNet yet still being fully operated in November, 1996 as a completion to JARING. In December 1997, TMNet leaded with 2% compared to JARING which are 51% and 49% respectively from overall Internet users in Malaysia [1]. TMNet and JARING are still remain two of the most popular ISP giants in Malaysia even though exist competitors from at least 70 other providers that providing access to Internet such as TimeNet, Maxis, Celcom and others[2].

An overall research conducted by St. Bernard Software in Jun 2004 comprises of 200 respondents leads to an important decision making in schools within 41 states in Philadelphia. These respondents proposed a strict actions or drastic steps that need to be taken in preventing Internet misused in schools. The research report is as follows[3]:

- 48% stated that students in their school surf Internet at least 2 hours a week within school period.
- 59% reported that exist incidents where students accessing inappropriate web site.

- 45% given examples of web sites surfing is to play games.
- 39% given examples of web sites surfing among students is to search for pornography resources and so forth.

Research done by Timothy Rumbourgh in 1999 to 600 students from Bloomsberg University indicates that 33% students have accessed pornography web sites [4]:

- 11% surfing web sites related to illegal drugs production.
- 8% accessing web sites that disseminate information on producing illegal weapons.
- 93% implementing Internet for educational purposes.
- 15% manipulating Internet resources to cheat in accomplishing assignments given by lecturer.

METHODOLOGY

This research is conducted primarily to acquire respondents' personal detail and educational background consists of age, gender and highest educational level. Besides that, it is also implemented to indicate Internet usage level among respondents comprises of Internet usage frequency, preferable activity when surfing Internet, most used search engine and also obsession to advertisements among teenagers within Klang Valley. This field study is conducted to acquire current and flexible data that can be used directly into problems analyzed [5]. A survey is selected as a research strategy type purposely to acquire as much as information about some population and can give descriptive picture or general interconnection of causes and effects [6]. A group of samples fulfilling the features or population behaviors that can represent or give a picture of the whole selected population are randomly selected. The strength of random sampling selection is due to the fairness / equality of every member in population to be chosen as respondents and the selection is not interfered with any members in the population [7]. Thus, teenagers that always hanging up at cyber café are totally neglected / rejected to be respondents in order of preventing from being influenced by teenagers that are computer literate and Internet literate. About 400 questionnaire forms being disseminate to respondents within Kuala Lumpur Shopping Complex (KLCC), Jaya Jusco Wangsa Maju, Carrefour Wangsa Maju, Medan Mara, Pertama Complex, National Library, Taman Tasik Titiwangsa, Tesco Mutiara Damansara and Ikea Damansara since these are well known and most visited area for teenagers. From the total of 400 questionnaire forms being disseminate, only 381 forms are returning back.

Respondents are randomly selected limiting to age 12 years old to 25 years old. Questionnaire form is the main research instrument in acquiring data comprises of 21 questions that should be filled up by respondents. To ensure respondents' privacy, personal details such as name are not included, thus preventing of fear ness or uncomfortably amongst respondents.

RESEARCH ANALYSIS

The discussion of research analysis are classified into two main features comprises of respondents' background and educational level analysis and also Internet usage analysis. Within respondents' background and educational level analysis, the analysis focuses on respondents' age, gender and their highest educational level. Whilst for Internet usage analysis, the Internet usage level among respondents comprises of Internet usage frequency, preferable activity when surfing Internet, most used search engine and also obsession to advertisements are briefly analyzed.

Respondents' Background and Educational Level Analysis

The analysis on respondents' background and educational level focuses on respondents' personal detail and educational background consists of age, gender and highest educational level.

Table 1: Respondents' Age

Table 3.2 shows that 381 respondents have returned back the questionnaire forms consists of 35.7% (136 persons) respondents aged between 12-15 years old, 33.3% (127 persons) respondents' aged between 16-19 years old, and 28.3% (108 persons) respondents' aged between 20-25 years old. The differentiation divide of respondents' aged are quite small, thus helping the researcher to get a quite similar overall respondents of these three age levels. There are 2.6% (10 persons) respondents aged over 25 years old and this is perhaps due to researchers' judgment fallacy during questionnaire distribution. These 10 respondents aged over 25

years old are rejected from this research analysis, thus total it up to only 371 analyzed respondents.

Table 2: Respondents' Gender

Table 3.3 displays number of respondents based on gender. Total of female respondents are 49% (183 persons) and total of male respondents are 51% (188 persons). Differs of male and female respondents are only 2 percents. The small differentiation on gender helped researcher to get an accurate and precise statistic findings, thus unbiased to any genders.

Table 3: Tabulation of Respondents Based On Age, Gender and Higher Education Level

Table 3.4 presents the tabulation of respondents' age divided into aged between 12-15 years old, 16-19 years old, 20-25 years old where each are classified based on gender, either female or male. The percentages of female respondents aged between 12-15 years old are 19.9% (74 persons), aged between 16-19 years old are 15.4% (57 persons) and for aged between 20-25 years old are 14% (52 persons). Whilst for male respondents aged between 12-15 years old are 16.4% (61 persons), aged between 16-19 years old are 18.9% (70 persons) and aged between 20-25 years old are 15.4% (57 persons). The age percentage tabulation based on gender for female respondents are between 14% to 19.9% and for male respondents are between 15.4% to 18.9%. The small differentiation among this percentage tabulation has helped in producing more accurate and precise data, thus unbiased within gender. This is an important random method features as each of members in population have similar chances to be chosen as respondents and respondents selection are not influenced by any members within the population.

Table 3.4 also indicates higher educational tabulation of respondents that are classified into four consists of primary school level, secondary school level, college level and university level. Percentages of respondents with primary school level as their highest educational background are 3 % (10 persons represented by three females and seven males). The percentages involving female respondents aged between 12-15 years old represented by three respondents and there are no female respondents aged between 16-19 years old and aged between 20-25 years old respectively. Whilst for the male respondents aged between 12-15 years old contributed by four persons, aged between 16-19 years old comprises of two persons and a person aged between 20-25 years old. Respondents with secondary school as their highest educational level are 57 % (213 persons represented by 102 female respondents and 111 male respondents), thus contributing to the largest number above of overall respondents. These percentages are classified by female respondents aged between 12-15 years old represented by 71 persons, aged between 16-19 years old comprises of 23 persons and only eight persons aged between 20-25 years old. Whilst for male respondents, there are 57 persons aged between 12-15 years old, 41 persons aged between 16-19 years old and 13 persons aged between 20-25 years old. Respondents with a college level as their highest educational background are 19 % (69 persons represented by 31 female respondents and 38 male respondents). There are no respondents aged between 12-15 years old. Female respondents aged between 16-19 years old are represented by 20 persons and for aged between 20-25 years old consists of 11 persons. Differs for male respondents, there are 19 persons aged between 16-19 years old and 20-25 years old respectively. As for university level as their highest educational background are formed by 79 respondents comprises of 47 female respondents and 38 male respondents contributed to 21%. There are no female and male respondents aged between 12-15 years old respectively. Female respondents aged between 16-19 years old are 14 persons and 33 persons aged between 20-25 years old. Whilst for male respondents aged between 16-19 years old are represented by eight persons and for aged between 20-25 years old consists of 24 persons. This tabulation directly summarizes that respondents aged between 12-15 years old implies to primary and secondary school as their highest educational level with no college or university level. Hence, this is precisely suits Malaysias' educational system for this syninomly aged level. While for respondents aged between 16-19 years old and 20-25 years old, their highest educational level start from primary to university level.

Internet Usage Analysis

Internet usage analysis discovers Internet usage level among respondents comprises of Internet usage frequency, preferable activity when surfing Internet, most used search engine and also obsession to advertisements among teenagers within Klang Valley.

Table 4: Internet Usage

Table 3.7 shows that from the total of overall respondents, 73% (271 persons) respondents always used Internet compared to respondents that seldom used Internet represented by 26% (95 persons) respondents and the rest of 1% (5 persons) respondents have given no answer.

Table 5: Age, Higher Educational Level and Internet Usage

Table 3.8 shows the tabulation of Internet usage due to respondents' age and educational level. Number of respondents that always used Internet aged between 12-15 years old are 21.3% (79 persons) represented by a person with primary school level and the rest of 78 respondents with secondary school level. Whilst for respondents that seldom used Internet aged between 12-15 years old are 14.6% (54 persons) contributed by four respondents with a primary school level and the rest 50 respondents with secondary school level. Respondents that have not given any answer aged between 12-15 years old are 0.5% (2 persons) represented by two respondents and no secondary school level respondents.

Respondents that always used Internet for aged between 16-19 years old are 28.8% (107 persons) represented by 50 respondents with secondary school level, 23 respondents with college level and 35 respondents with university level. Respondents that seldom used Internet aged between 16-19 years old are 5.4% (20 persons) contributed by two respondents with primary school level, 14 respondents with secondary school level and the rest of four respondents with college level. While for the respondents that have given no answers, aged between 16-19 years old are 0.5% (2 respondents) represented by two respondents with college level.

Respondents that always use Internet by aging of 20-25 years old are 22.9% (85 persons) represented by eight respondents with secondary school level, 35 respondents with college level and 54 respondents with university level. Respondents that seldom used internet by aging of 20-25 years old are 5.7% (21 persons) contributed by 13 respondents with secondary school level, five respondents with college level and three respondents with university level. Respondents that have not given any answers aged between 20-25 years old are 0.3% (1 person) with primary school level.

Table 6: Total Hours of Internet Usage

Table 3.9 presents the total number of Internet usage due to total hours. From an overall of 371 respondents, 36.9% (137 persons) have given no answers. Only 0.8% (3 persons) of respondents used Internet less than an hour. About 14.3% (53 persons) respondents spent an hour each time when surfing internet whilst 25.1% (93 persons) respondents used Internet for two hours. About 12.4% (46 persons) respondents have used Internet for three hours and 2.4% (9 persons) respondents have used internet for four hours. Respondents that used Internet for five hours are represented by 3% (11 persons) respondents, 1.1% (4 persons) respondents have used it for six hours, 0.8% (3 persons) respondents for eight hours and the rest of 3% (11 persons) respondents have used Internet more than 10 hours.

Table 7: Activity During Internet Surfing

Table 3.10 shows activities done by user when surfing Internet. Each of activities involves overall respondents which is 371 respondents. The most popular activity during Internet surfing is email where 50% (185 persons) respondents used it when surfing. Searching articles or journals are the second most popular activity contributed by 43% (160 persons) respondents. The third activity that also being done by 39% (146 persons) respondents are online chatting whilst the fourth most popular activity are downloading or online gaming represented by 31% (115 persons). About 12% (43 persons) respondents surf Internet unpurposely and 6% (23 persons) respondents done other activities such as meeting new friends, songs searching, work-related, sports, programming code searching and interaction using specific web pages such as Friendster and Myspace.

Table 8: Current Search Engine

Table 3.11 shows the most popular search engine used by respondents consists of Yahoo, Google, Netscape and Altavista contributed by 86.8% (322 persons) respondents compared to search engines such as Dogpile and Mamma which only represented by 1.9% (7 persons) respondents and other search engines used are only 0.3% (1 persons) whilst 11.1% (41 person) respondents given no specific answer.

Table 9: Attractiveness to the Advertisement Displayed Within Web Pages

Table 3.12 displays that 29.9% (111 persons) respondents attracted to the advertisements displays on web pages and have clicked on it. About 63.6 % (236 persons) respondents are not attracted to any advertisements within web pages and the rest 6.5% (24 persons) given no answer at all.

Table 10: Ever Surf Pornography Web Page

Table 3.13 presents the tabulation of respondents that surf pornography web pages. About 35.8% (133 persons) respondents ever surf pornography web pages whilst 61.7% (229 persons) respondents have never surf pornography web pages and the rest 2.4% (9 persons) respondents have given no answer.

CONCLUSION

The Internet usage level from this research has shown that 73% respondents always used Internet. The highest percentages of Internet usage are 2 hours representing by 25.1% respondents. The most popular activity during Internet surfing are email where 50% respondents used email when surfing Internet. The second most popular activity is searching for articles or journals contributed by 43% respondents. Whilst for the third activity falls to online chat (chatting) which is 39% respondents. Downloading or online gaming (online games) falls under fourth most popular activity contributed by 31% respondents, 12% respondents accessing website without purposes/reasons and the rest 6% respondents used it for other activities such as meeting new friends, songs searching, work-related, sports, programming code searching and interaction using specific web pages such as Friendster and Myspace. The most popular search engines used by respondents are Yahoo, Google, Netscape and Altavista represented by 86.8% respondents. About 29.9% respondents admit the attractiveness to advertisements displayed within web pages and have clicked on it. This research indicates that majority of respondents are equip with Internet usage skills and do multiple activities regarding to their needs. Part of respondents also influence by advertisements within web pages and indirectly becoming the causes of surfing pornography web pages.

ACKNOWLEDGEMENT

Sources of Funding : University Malaya, Malaysia

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Table 1: Respondents' Age

Respondents' Age	Number	Percentage (%)	Percentage (%) of Teenagers Only (n = 371)
12-15 years old	136	36	37
16-19 years old	127	33	34
20-25 years old	108	28	29
More than 25 years old	10	3	
Total	381	100	100

Source: Questionnaire Form 2006[8]

Table 2: Respondents' Gender

Gender	Number	Percentage (%)
Female	183	49
Male	188	51
Total	371	100

Source: Questionnaire Form 2006[8]

Table 3: Tabulation of Respondents Based On Age, Gender and Higher Education Level

Gender	Age	Higher Education				Total	Percentage (%)
		Primary	Secondary	College	University		
Female	12-15 years old		3	71	-	-	74	19.9
	16-19 years old		-	23	20	14	57	15.4
	20-25 years old		-	8	11	33	52	14.0
Male	12-15 years old		4	57	-	-	61	16.4
	16-19 years old		2	41	19	8	70	18.9
	20-25 years old		1	13	19	24	57	15.4
Total			10	213	69	79	371	100
Percentage (%)			3	57	19	21	100%	

Source: Questionnaire Form 2006[8]

Table 4: Internet Usage

Internet Usage	Number	Percentage (%)
Always used internet	271	73
Seldom used internet	95	26
No answer	5	1
Total	371	100

Source: Questionnaire Form 2006[8]

Table 5: Age, Higher Educational Level and Internet Usage

Internet Usage	Age	Higher Educational Level				Total	Percentage (%)
		Primary	Secondary	College	University		
Always	12-15 years old	1	78			79	21.3
	16-19 years old		50	35	22	107	28.8
	20-25 years old		8	23	54	85	22.9
Seldom	12-15 years old	4	50			54	14.6
	16-19 years old	2	14	4		20	5.4
	20-25 years old		13	5	3	21	5.7
No Answer	12-15 years old	2				2	0.5
	16-19 years old			2		2	0.5
	20-25 years old	1				1	0.3
Total		10	213	69	79	371	100
Percentage (%)		3	57	19	21	100%	

Source: Questionnaire Form 2006[8]

Table 6: Total Hours of Internet Usage

Internet Usage Due to Total of Hours	Number	Percentage (%)
No answer	137	36.9
Less than an hour	3	0.8
1 hour	53	14.3
2 hours	93	25.1
3 hours	46	12.4
4 hours	9	2.4
5 hours	11	3.0
6 hours	4	1.1
7 hours	0	0.0
8 hours	3	0.8
9 hours	1	0.3
More than 10 hours	11	3.0
Total	371	100

Source: Questionnaire Form 2006[8]

Table 7: Activity During Internet Surfing

Activity	Number	Percentage (%) n=371
Email	185	50
Downloading or online gaming	115	31
Online chatting	146	39
Articles or journals searching	160	43
Surfing internet without purposes/reasons	43	12
Other activities	23	6

Source: Questionnaire Form 2006[8]

Table 8: Current Search Engine

Search Engine	Number	Percentage (%)
Yahoo, Google, Netscape, Altavista	322	86.8
Dogpile, Mamma	7	1.9
Others	1	0.3
No Answer	41	11.1
Total	371	100

Source: Questionnaire Form 2006[8]

Table 9: Attractiveness to the Advertisement Displayed Within Web Pages

Attractiveness to Advertisement	Number	Percentage (%)
Attracted and Click	111	29.9
Not Attracted	236	63.6
No Answer	24	6.5
Total	371	100

Source: Questionnaire Form 2006[8]

Table 10: Ever Surf Pornography Web Page

Ever Surf Pornography Web Page	Number	Percentage (%)
Yes	133	35.8
No	229	61.7
No Answer	9	2.4
Total	371	100

Source: Questionnaire Form 2006[8]

Analysis of Teacher-Student Interaction in the Topobo course

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This study used creative thinking spiral proposed by Resnick (2007) as the framework of the Topobo course. The teaching-learning process included five elements: imagine, create, play, share and reflect, and we analyzed the patterns of teacher-student interaction behavior. One student and one teacher participated in this study. The student was a five-year-old child, and a preschool teacher. The course topic is "Adventure of Monster Island". Chi square test was used to compare different types of the teacher-student interaction behaviors.

The result showed t that the occurrence of different teacher-student interaction behaviors were significantly different (X^2=87.94, p<.001). After comparing different teacher-student interaction behaviors, it was found that the behavior occurred most frequently is student's "play" (N=108, 25%), the second one was student's "share" behavior (N=83, 19.21%), and the third one was teacher's "guide" behavior (N=80, 18.52%). The result indicated that in the Topobo course, "play" was the most frequent behavior during the teaching-learning process. Through playing the tangible bricks, Topobo, students learned to express and share their ideas and experiences with others. Moreover, in this course, the teacher did not directly provide possible solutions, but tried to guide the student to fine out his own the possible solution. In the future, the lag sequential analysis method could be applied to further investigate the interaction pattern between teacher and student.

AN EXAMINATION OF PREDICTOR VARIABLES FOR PROBLEMATIC INTERNET USE

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ABSTRACT

This study examines problematic Internet use among university students in terms of gender, while also gauging the impact of personality traits, life satisfaction and loneliness variables on problematic Internet use. A total of 411 university students studying Education in North Cyprus participated in the study. The participants were selected using quota sampling; 64 percent (n=263) of the participants were female and 36 percent (n=148) were male. Data was collected using the Online Cognition Scale (OCS), UCLA Loneliness Scale, Life Satisfaction Scale (LSS) and Eysenck Personality Questionnaire Revised-Abbreviated Form (EPQR-A), and was analysed using "t-Test" and multiple regression methods. Findings suggest that problematic Internet use shows significant variation depending on gender. Predictor variables (neuroticism, extraversion, psychoticism, lie, life satisfaction, and loneliness) meaningfully predict problematic Internet use.

Keywords: Problematic Internet use, personality traits, life satisfaction, loneliness, university students

INTRODUCTION

With recent technological developments, computers and the Internet have become crucial communication channels. While making life easier, however, these technologies have brought with them new risks. For over a decade, problematic Internet use has attracted unparalleled attention and has been widely researched. Researchers have sought to better understand problematic Internet use (Eldeleklioğlu, 2008; Griffiths, 1996; 1997; Kaltiala-Heino, Lintonen, Rimpela, 2004; Kim, LaRose & Peng, 2009; Morahan-Martin, 2007, 2008; Tahiroglu, Çelik, Uzel, Özcan & Avcı, 2008; Özcan, 2004, 2006; Özcan & Buzlu, 2005; Yellowlees, & Marks, 2007; Young & Rogers, 1998; and Widyanto & Griffiths, 2007).

Even though problematic Internet use is often labelled as a type of pathological behaviour, healthy people may also suffer from its symptoms. It was suggested that problematic Internet use as well as negative cognitive, emotional and behavioural consequences are caused by multidimensional interpersonal relationships and life challenges (Caplan, 2002; 2003; 2005; Chak & Leung, 2004; Davis, Flett & Besser, 2002; Leung, 2004; Morahan-Martin & Schumacher, 2000; Young, 1998; Young & Rogers, 1998). Studies conducted in Turkey primarily focus on Internet addiction and pathological Internet use (Bölükbaş, 2003; Gönül, 2002; Öztürk, Odabaşıoğlu, Eraslan, Genç & Kalyoncu, 2007). However, more research needs to be done.

The relationship between psychosocial wellbeing and Internet use is an established area of research interest, with studies on obsessive Internet use suggesting the negative influence of uncontrollable Internet use on health variables such as depression and loneliness (Koç, 2011; Moody, 2001; Morahan-Martin, 2007, 2008; Whang, Lee & Chang, 2003). Whang, Lee, and Chang (2003) report that people obsessed with the Internet are oversensitive to disappointment resulting from interpersonal relationships and show increased anxiety when communicating with people they do not know well. When compared with the control group, Internet addicts were found to have higher levels of depression and compulsive tendencies (Özcan, & Buzlu, 2005; Öztürk et al., 2007).

Psychosocial disorders such as loneliness and depression are also associated with problematic Internet use. Studies suggest that such disorders can result in problematic Internet use (Caplan, 2007; LaRose, Lin & Eastin, 2003; Sanders, Field, Diego & Kaplan, 2000). To understand why people suffering from psychological disorders develop a tendency for problematic Internet use or how problematic Internet use leads to psychological problems, some theories on the topic need to be examined. Personal issues arising through problematic Internet use could be mitigated by identifying factors of problematic use that the user finds appealing (Griffiths, 2000). A number of theories have been suggested to explain the reasons for Internet use. Cognitive-behavioural theory (Davis, 2001), the social skill model (Caplan, 2005), and social-cognitive theory (LaRose, Lin, & Eastin, 2003) could be employed.

Davis (2001) uses cognitive-behavioural theory to explain problematic Internet use as a psychiatric condition characterized by incompatible thoughts and pathological behaviour. Cognitive-behavioural theory does not define problematic Internet use simply as a behavioural addiction, but also as a cognitive-behavioural condition with serious negative impacts on one's life. According to Davis, people suffering from obsessive thoughts start to accept the Internet as a 'friend,' and this in turn triggers problematic behaviour (Yellowlees & Marks, 2007). Grohol (1999) explains Internet addiction using the cognitive-behavioural approach. Rather than examining the nature of the addiction, he focuses on the 'compulsive behaviour' and its 'treatment' (Özcan & Buzlu, 2005). Problematic Internet use is defined as a multidimensional condition leading to negative social, academic and professional outcomes and manifesting cognitive-behavioural symptoms (Caplan, 2005). Cognitive-behavioural theory concentrates on 'irrational beliefs' and possible changes in these beliefs. The individual finds excuses to spend more time online. Classic conditioning, an aspect of behavioural theory, argues that even though the Internet does not have much meaning in the beginning, it can become a pleasure the user wants to repeat when s/he starts to have positive experiences with online games and chat. Operant conditioning, on the other hand, argues that reaching information quickly using the Internet and engaging in virtual relationships are reinforcing activities (Beard, 2005; Serin, 2011).

Research shows that personality traits and psychological disorders play an important role in developing Internet addiction, particularly in adults; it also demonstrates that Internet addiction leads to a decrease in psychosocial wellbeing for adults. These findings support the view that there is a two-way relationship between Internet addiction and mental health (Ceyhan, 2008; Morahan-Martin, 2007; Whang, Lee & Chang, 2003). It is possible to find users suffering from Internet addiction in different cultures, where adults are also reported as being most at risk (Ceyhan, 2008; Kim, Namkoong, Taeyun & Kim, 2008; Ko, Yen, Chen, Chen, Wu, & Yen, 2006; Lin, & Tsai, 2002; Yen, Ko, Yen, Chen, Chung, & Chen, 2008). An increasing number of adults show symptoms of Internet addiction or pathological/unhealthy Internet use, and their daily life, academic success and social relationships are influenced negatively (Ceyhan, 2008).

Davis (2001) states that psychosocial disorders such as loneliness and depression are indirect results of problematic Internet use. Caplan (2005) argues that these users prefer online communication because they find it much less risky than face-to-face communication. Involuntary Internet use, on the other hand, causes negative outcomes such as low grades, absenteeism, and reduced social interaction. Social-skills theory (Kim, LaRose & Peng, 2009) argues that individuals observe people around them and tend to exhibit behaviours that they feel are appropriate for the social context. Socio-cultural theory, on the other hand, focuses on the familial, social and cultural dynamics that lead to compulsive Internet use. For instance, for users who use the Internet to escape family-related problems, the Internet can turn into an addiction (Beard, 2005).

Lake (1990) suggests that lonely people often show symptoms of depression and anger while also demonstrating a tendency to misunderstand people. Loneliness can be described as the inner emotional reflection of interpersonal losses, needs and incompetence. The increase in loneliness is mirrored by the increase in depressive symptoms (Pretorious, 1993). Young (1982) argues that to prevent loneliness, irrational beliefs of lonely people need to be addressed. Killen (1998) has investigated loneliness within the sociocultural framework. This view states that the individual who has problems complying with social norms feels lonely in his lack of conformity. Scholars have described young people as deprived of social skills and pessimistic about relationships with other people (Demir & Tezer, 1995; Deniz, Hamarta, & Arı, 2005; Jones, Hobbs, & Hockenbury, 1982; Marcoen, Brumagne, 1985). Brage, Meredith, & Woodward (1993) found that older adults are lonelier than younger adults and that there is a significant correlation between loneliness and depression. In a study investigating loneliness in university students, Demir (1990) found that 15.4% of the research sample suffered from loneliness. There are also scholars who study the correlation between loneliness and Internet use (Caplan, 2002; Eldeleklioğlu, 2008; Kim, LaRose & Peng, 2009; Morahan- Martin & Schumacher, 2000; Özcan, & Buzlu, 2005; 2007; Whang, Lee & Chang, 2003).
Life satisfaction is defined as the extent to which an individual accomplishes set targets (Koç, 2001) and as the positive evaluation of one's life with regard to set targets (Diener, Emmons, Larsen & Griffin, 1985). Life satisfaction refers to the state of wellbeing expressed by different positive emotions such as happiness and morale as well as feeling positive with regard to everyday relationships. Recently, an increase was observed in the number of studies investigating the variables that influence the degree of life satisfaction among university students (Bulut Serin, Serin & Özbaş, 2010; Bulut Serin, Aydınoğlu & Aysan, 2010; Çivitçi, 2007; Deniz, 2006; Gündoğar, Gül, Uskun, Demirci & Keçeci 2007; Çeçen, 2008). However, no study was found on the correlation of life satisfaction and problematic Internet use.

Problems faced by university students, such as adaptation difficulties and underlying psychological problems, cause problematic Internet use (İşbulan, 2011; Koç, 2011; Şahin, Balta & Ercan, 2010; Toprakçı, 2007). Kandell (1998) highlights that in comparison to other age groups, Internet addiction is a bigger problem among university students. Being away from home, using spare time badly, and use of the Internet for educational reasons are listed as some of the reasons for increased risk for addiction for this group. However, these studies have not sufficiently set forth the reasons for problematic Internet use. Studies focusing on the reasons for problematic Internet use in Turkey are scarce, as is the case

around the world. This study aims to investigate both the correlation between gender and problematic Internet use and the impact of personality traits, life satisfaction and loneliness variables on the problematic Internet use among university students. Within this general framework, answers to the following questions were sought:

a. does problematic Internet use among university students show significant difference in terms of gender?
b. to what extend do personality traits, life satisfaction and loneliness variables predict the levels of problematic Internet use?

RESEARCH METHODOLOGY

Research Design

This study uses a quantitative descriptive design to explain the correlation between levels of problematic Internet use among university students and personality traits, life satisfaction and loneliness variables.

The Sample

The research sample is comprised of 411 students studying in the Faculty of Education at a private university in the Turkish Republic of Northern Cyprus, selected using quota sampling. 64 percent (n=263) of the participants are female and 36 percent (n=148) are male. Prior to data collection, students were provided with information about the study and only those who volunteered to take part were chosen.

Data Collection Methods

Data was collected using Online Cognition Scale (OCS), Revised-Abbreviated Eysenck Personality Questionnaire Form (EPQR-A), Lie Satisfaction Scale (LSS) and UCLA Loneliness Scale. Each is explained below.

Online Cognition Scale (OCS): Developed by Davis, Flett, & Besser (2002), to assess Problematic Internet Use along with its four sub-dimensions (loneliness/depression, diminished impulse control, distraction, and social comfort), the scale is made up of 36 items on a 7-point Likert scale. The Online Cognition Scale was adapted for use in Turkey by Özcan with a test-retest reliability determined as r=.90 and the standardized alpha .93 (Özcan, 2004). Reliability is high with Cronbach Alpha of .89.

Eysenck Personality Questionnaire Revised-Abbreviated Form (EPQR-A): Upon revising the 48 item Eysenck Personality Questionnaire, Eysenck, Eysenck & Barrett (1985) created the Eysenck Personality Questionnaire Revised-Abbreviated Form. The questionnaire is made up of 24 items and examines identity using three main factors: (a) extraversion, (b) neuroticism, and (c) psychoticism. Additionally, a lie sub scale is administered to prevent possible bias and to check validity. Each of these factors is examined through 6 items and participants are asked to answer each of the 24 questions 'yes' (1) or 'no' (0). For each personality type, participants are scored from 0 to 6.

Life Satisfaction Scale (LSS): The Life Satisfaction Scale was developed by Diener, Emmans, Larsen and Griffin (1985). It is made up of 5 items on a 7-point Likert scale and measures subjective wellbeing. Internal consistency ranges from .80 to .89. Cronback Alpha reliability was .84.

UCLA Loneliness Scale (UCLA-LS): UCLA Loneliness Scale was developed by Russell, Peplau and Cutrona (1980); the validity and reliability of its adapted version is tested by Demir (1989). The scale measures the overall feelings of loneliness in individuals through a self-report Likert-type scale comprised of 20 items. 10 of these items are positive statements and the rest are negative statements. The scale reports range from 20 to 80 where higher scores mean a higher degree of feelings of loneliness. Reliability of the scale is reported as .96. In this study, Cronbach Alpha reliability is found to be .93.

Data Analysis

Multiple regression analysis was used to identify the main predictors of problematic Internet use while t-Test analysis assessed the correlation between gender and problematic Internet use. Data was analysed using SPSS. A significance level of .05 was accepted.

FINDINGS

This study examines problematic Internet use in terms of gender variables. Table 1 reports the mean scores, standard deviation, and t-values of female and male students in relation to the Online Cognition Scale.

Table 1. Mean scores, standard deviation, and t-values of problematic Internet use according to gender

Variables	Gender	n	Mean	SD	t_{409}	p-value
Social support	Female	263	28.866	13.835	3.604	.000*
	Male	148	33.932	13.397		
Loneliness-depression	Female	263	12.304	6.843	3.827	.000*
	Male	148	15.135	7.789		
Reduced impulse control	Female	263	22.836	10.853	3.747	.000*
	Male	148	26.966	10.495		
Distraction	Female	263	17.418	8.659	2.823	.005*
	Male	148	19.932	8.678		
Problematic Internet use	Female	263	81.425	36.390	3.933	.000*
	Male	148	95.966	35.244		

*p<.05

In Table 1, the differentiation of levels of problematic use among students is examined using t-Test analysis. The independent variable is gender. A statistically significant differentiation can be found between the mean for levels of problematic Internet use (t=3.93<.05) and sub-dimensions of social support (t=3.60; p<.05), loneliness-depression (t=3.82; p<.05), reduced impulse control (t=3.74; p<.05), and distraction (t=2.82; p<.05). As Table 1 demonstrates, mean scores of males with regard to problematic Internet use and its sub-dimensions are higher than those of female students.

Correlations of scores for the Online Cognition Scale, Eysenck Personality Questionnaire Revised-Abbreviated Form, and UCLA Loneliness Scale are given in Table 2. It was found that the scattering diagram, which was designed for standardised residual values and predicted values, identifies a linear relationship, and points tend to be collected around an axis. arithmetic mean, standard deviation and correlation values about predictors (neuroticism, extraversion, psychoticism, lying, life satisfaction, loneliness) are given before regression analysis. When the scattering diagrams and correlations based on the partial relationships between predictor variables and problematic Internet use are examined, there is a positive and linear correlation between problematic Internet use and neuroticism, extraversion, psychoticism and lying. When Table 2 is examined, it is apparent that the correlation of dependent variables is not high enough to cause multicollinearity problem. During multi regression analysis a linear relationship was observed between predictors and problematic Internet use, as well as normal distribution.

Table 2. Arithmetic Mean, Standard Deviation and Correlation Martix Values of the variables used to predict problematic Internet use.

Variables	1	2	3	4	5	6	7	Mean	SD
Neuroticism (1)	-							3.260	1.763
Extraversion (2)	-.495**	-						3.669	1.792
Psychoticism (3)	-.092*	.122*	-					1.712	1.086
Lie (4)	-.119*	.119*	-.134*	-				3.785	1.561
Life Satisfaction (5)	-.070	.148*	.003	.341**	-			24.815	6.297
Loneliness (6)	-.003	.160*	-.162*	.192**	.198**	-		57.747	9.785
Problematic Internet use (7)	- .787**	.544**	,117*	.223**	.258**	.032	-	86.661	36.611

**p< .01 *p< .05

Multiple regression analysis relating to predictor variables of neuroticism, extraversion, psychoticism, life satisfaction and lying, and prediction of problematic Internet use. Results of the analysis is provided in Table 3.

Table 3. The variables that predict Problematic Internet use according to multiple linear regression analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant)	89.047	7.853		11.339	.000			
Neuroticism	-13.737	.655	-.674	-20.983	.000	-.787	-.722	-.581
Extraversion	4.256	.779	.179	5.464	.000	.544	.262	.151
Psychoticism	1.242	.965	.037	1.287	.199	.117	.064	.036

Lie	1.709	.661	.078	2.586	.010	.223	.128	.072
Life satisfacton	.836	.152	.165	5.507	.000	.258	.264	.152
Loneliness	-.152	.110	-.041	-1.388	.166	.032	-.069	-.038
$R= .831$ $R^2=.690$ $F_{(6, 404)}=150.211$ $p=.000$								

Predictors: Neuroticism, extraversion, psychoticism, lying, life satisfaction, loneliness
Dependent Variable: Problematic Internet use

Examination of Table 3 reveals a negative correlation at a high level (r= -.79) between neuroticism and problematic Internet use when the binary and partial correlations between predictor variables (neuroticism, extraversion, psychoticism, lying, life satisfaction, loneliness) and the dependent variable (problematic Internet use) are examined. However, when other variables are examined, it appears that the correlation between two variables is r= -.73. The analysis also reveals a positive meaningful correlation at a medium level between extraversion and problematic Internet use. However, when the other five variables are examined, it appears that this correlation is calculated as r=.26. A positive correlation at a low level (r=.22) is perceived between lying and problematic Internet use; however, when this is compared with other variables, the correlation between two variables becomes r= -.13. Similarly, there is a positive correlation at a low level (r=.25) between life satisfaction and problematic Internet use. When this is compared with other variables, the correlation between two variables becomes r= -.26. Along with extraversion, psychoticism, lying, life satisfaction, and loneliness, neuroticism has a strong meaningful correlation with problematic Internet use among university students ($R= .831$, $R^2 =.690$, $p<.01$). The six variables examined here explain 69 percent of total variance in problematic Internet use. According the standardised regression coefficient (B), predictor variables can be ordered relative to their importance in problematic Internet use as neuroticism, extraversion, psychoticism, lying, life satisfaction, and loneliness. When t-Test results about the significance of regression coefficient are examined, neuroticism, extraversion, lying and life satisfaction variables appear to be significant predictors for problematic Internet use. On the other hand, psychoticism and loneliness are not significant predictors of problematic Internet use. According to regression analysis, the regression equation of problematic Internet use prediction is as follows: Problematic Internet Use = 89.047 – 13.737 Neuroticism +4.256 Extraversion, +1.242 Psychoticism, +1.709 Lie, + .839 Life Satisfaction, - .152 Loneliness.

From scatter diagrams that are based on the partial relationships of predictor variables (neuroticism, extraversion, psychoticism, lying, life satisfaction, and loneliness) with problematic Internet use, it is seen that there is a linear positive correlation between problematic Internet use and extraversion, psychoticism, lying and life satisfaction. It was also found that there is a linear and negative correlation between problematic Internet use, neuroticism and loneliness.

DISCUSSION

This section discusses the findings derived from the statistical analysis with reference to the relevant literature.

In this study problematic Internet use and its sub-dimensions of social support, loneliness, depression, decreased impulse control and levels of distraction showed significant variations in terms of gender among university students. Male students were found to suffer more from problematic Internet use. These findings are consistent with the relevant literature (Balta & Horzum, 2008; Choi, 2001; Li & Chung, 2006; Tahiroğlu, Çelik, Uzel, Özcan, & Avcı, 2008; Weitzman, 2000). Possible interpretations of this data are that in comparison to male students, female students have better communication skills, or that male students prefer the Internet to face-to-face communication. On the other hand, Ceyhan (2007), Kim, Namkoong, Taeyun & Kim (2008), Oğuz, Zayim, Özel & Saka (2008) did not find any significant correlation between gender and problematic Internet use. Other studies have found a correlation between problematic Internet use and impulse control disorder (Beard & Wolf, 2001; Davis, Flett, & Besser, 2002). It was suggested that the majority of Internet users engaged in problematic Internet use suffer from impulse control disorder, have a history of addiction disorder, and express this as a deviant behaviour using salient online activities (Yellowlees & Marks, 2007).

The study has also found that neuroticism, extraversion, psychoticism and lying variables are meaningful predictors of the problematic Internet use variable. Neuroticism was found to be the best predictor followed by extraversion, psychoticism and lying. Examination of the relevant literature shows that these findings are consistent with the previous studies. In their studies of adults, Cao & Su (2007) found that those suffering from Internet addiction received higher scores on the neuroticism, psychoticism, and lying sub-dimensions of Eysenck Personality Questionnaire Revised-Abbreviated Form. Adults with neurotic personality traits use the Internet for interpersonal communication and entertainment whereas extraverts use it solely for interpersonal communication (Wolfradt & Doll, 2001 cited in Ceyhan, 2008). Another study found positive correlations between game addiction and high narcissistic personality traits, higher degrees of aggression, and low self-control (Kim, Namkoong, Taeyun & Kim, 2008).

Life satisfaction was found to predict problematic Internet use at a low level. Studies focusing on the correlation between problematic Internet use among university students and life satisfaction are highly limited. Studies concentrate on the impact of personality as an internal factor on subjective wellbeing (Diener, Oishi & Lucas, 2003). Deneve & Cooper (1998) found that personality is a strong predictor of life satisfaction and happiness. In a study on Taiwanese adults, Ko, Yen, Yen, Lin & Yang (2007) investigated the extent to which personality traits, self-esteem, life satisfaction, mental health, and family functions predict Internet addiction. Research shows that personality traits and mental health disorders, particularly in adults, play an important role in developing Internet addiction and Internet addiction leads to a decrease in life satisfaction and social wellbeing (Koç, 2011; Moody, 2001; Morahan-Martin, 2007, 2008; Whang, Lee & Chang, 2003).

Loneliness was also found meaningfully to predict problematic Internet use at a low level. There is research showing that those who are suffering from high levels of problematic Internet use also have high levels of loneliness (Ayaroğlu, 2002; Ceyhan, 2007; Caplan, 2002; Eldeleklioğlu, 2008; Kim, LaRose & Peng, 2009; Kurtaran, 2008; Morahan-Martin & Schumacher, 2000; Morahan-Martin & Schumacher, 2003; Sanders, Field, Diego & Kaplan, 2000; Özcan, & Buzlu, 2005; Whang, Lee, & Chang, 2003). In a study on university students, Koç (2011) concluded that Internet use leads to an increase in psychological disorders such as depression and loneliness. Furthermore, Internet addicts who lack social support look for online solutions to their problems, and this leads to further psychological problems and symptoms of anxiety.

CONCLUSIONS AND RECOMMENDATIONS

This section makes informed suggestions about Internet addiction using the findings of this study.

This study concludes that males are more at risk than females in terms of problematic Internet use. Social support programs as well as individual and group work could be suggested for both male and female students that are at risk. Personality traits, life satisfaction and loneliness are significant predictors of problematic Internet use among students. Precautions need to be taken for university students to develop healthy personality traits, to enhance positive feelings and happiness, and to form social support networks.

It was observed that university students are the group most at risk in terms of developing problematic Internet use (Nalwa & Anand, 2003). That the Internet is always available, and is fast and free, are given as reasons for the problem. Researchers who argue that the Internet addiction is formed cognitively believe that cognitive behavioural therapy is a viable treatment (Davis, 2001; Yellowlees, 2001). These treatment strategies suggest a cognitive reconstruction regarding the Internet applications users often use, along with behavioural exercises and therapies. Students who manifest a high degree of problematic Internet use could be treated by cognitive behavioural therapy provided by psychological consultants working in counselling and guidance centres. Additionally, seminars, conferences and activities could be organised to highlight the negative consequences of problematic Internet use.

This study has some limitations. It examines solely problematic Internet use, personality traits, life satisfaction and loneliness and the correlation among these factors. With regard to the methods, the main limitation of the study is its being a descriptive study and as such not being able to identify causal linkages among the factors it investigates. Another limitation of the study is that it was carried out only in one university with no consideration of the socio-economic conditions of the participants. It would be appropriate to conduct quantitative and qualitative studies with a larger and more heterogeneous sample. These are the serious limitations of this study. However, studies focusing on the impacts of the Internet within the context of Northern Cyprus are very new and highly limited. It is believed that the findings of this study can help decrease the negative consequences of problematic Internet use.

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ASSESSING THE EFFECTIVENESS OF MULTIMEDIA IN PHYSICS AT UNDERGRADUATE LEVEL

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ABSTRACT

In this study, the effects of interactive multimedia package investigated in classroom on students' achievement in physics. Two groups – one control group and one experimental group of students at second year undergraduate level were studied to determine the role of computer simulations and animations in the development of functional understanding of the concepts of displacement, velocity, and acceleration. To investigate students understanding a diagnostic test on oscillations was administered to the students. The difficulty and discrimination indices of the test are found to be 0.40 and 0.498 respectively. Multimedia package was used in the classroom for experimental group while for control group the topic was revised by traditional method. The experimental group showed significant change in achievement as compared to control group. The results of this study strongly support that the multimedia assisted instructions in classroom learning help students confront their cognitive constraints and foster a functional understanding of physics.
Keywords : Multimedia, Simulations, Physics education, Oscillations.

INTRODUCTION

Over the three decades, physics educators have begun to look more closely at what their students understand about physics concepts. Physics education research (PER) differs from the traditional education research. In PER, the emphasis is on the student understanding of science content rather than educational theory or methodology (McDermott, 2001). Significant amount of efforts have been put by physics education researchers to explore the students difficulties in understanding physics concepts They found that many students taught traditionally, in a lecture based format, lack a solid conceptual understanding of physics, that many students also have trouble with quantitative problem solving and other skills, and their epistemologies are often different than the epistemology of a scientist(Meltzer, 2005; Maloney et. al., 2001, Thacker, 2003). PER has demonstrated that traditional lecture, recitation, and lab instruction is not helping many students in introductory physics classes to develop a functional understanding of physics concepts (Saul, 1998). Researchers in physics education have reported that interactive- engagement teaching methods are effective in conceptual learning of students as compared to traditional instructional method (Hake, 1998; Meltzer & Manivannan, 2002).

The use of computer technology in teaching environment provides wide-range of alternatives to students such as visualization of abstract concepts that will foster student understanding. Such alternatives would be complementary to traditional teaching (Fraser et. al., 2007). Computer simulations seem to be one of the most effective ways to use computers in physics education. A variety of visual representations in the computer simulations make concepts visible that are otherwise invisible to students (Finkelstein et. al. 2005). They encourage students to carry out the processes used in physics research: to question, predict, hypothesize, observe, interpret results etc. (Holec, Spodniaková Pfefferová, & Raganová, 2004). Computer simulations provide students the opportunity to isolate and manipulate parameters and therefore help students to develop an understanding of the relationships among physical concepts, variables and phenomena (Jimoyiannis & Komis, 2001).

Computer simulation when used as an instructional material in teaching physics, motivates and cultivates students' interest in learning physics, and can heighten the individualized instruction by allowing students to proceed on their own pace and are able to go back to master the skills (Ubiña & Patricio, 2007).

Computer animations offer the potential for increased learning when there is a need for external visualization and when the content depends on an understanding of motion (Dancy & Beichner, 2006).

The present study aims to investigate whether computer assisted instruction is more effective than traditional instruction in increasing student success in physics. The topic of "Oscillations" was selected for instructions since it is hard to understand and at the same time suitable for animation and simulation in computer environment. Students have difficulty to visualize the change in velocity, acceleration along the path of oscillator. By providing animations and simulations through computer assisted instructions (CAI) to students, it was aimed to help better understand the physical processes without entirely depending on the mathematical definitions (Gonen, Kocakaya, & Inan, 2006). For this purpose Interactive Multimedia on Oscillations is developed.

RESEARCH OBJECTIVES

Objectives of this study were to develop and evaluate an interactive computer based animation and simulation package on Oscillations and to provide second year undergraduate students of University of Pune with an interactive means of self-learning and evaluation.

RESEARCH QUESTIONS

To identify students' difficulties authors had set following points for this study.

1) Student's ability to interpret equations
2) Student's ability to interpret graphical representations
3) Student's response to the questions posed in different representations
4) Consistency in conceptual understanding.

MATERIALS AND METHODS

Subjects : The subjects of this study were second year undergraduate students (aged 18 to 19) from Prof. Ramkrishna More College, Pune affiliated to Pune University in the second semester academic year 2008-09 and 2009-10. The students were randomly selected for two groups, Control group (N = 23), Experimental group (N = 23).

Instruments : For data collection, an Oscillations Concept Test (OCT) which is composed of 20 items of multiple choices was administered to subjects. The items in the OCT were selected from 28 items following expert's advice on the basis of level of difficulty and the indexes of defined differences. OCT covers the instructional objectives for the unit of Oscillations. Students had to choose correct alternative for each item as well as give justification for the same. The reliability constant of the test has been determined according to Kuder-Richardson method and has been identified as 0.924.

Treatment : The traditional instruction was conducted over 12 lecture hours. The pretest was administered to 58 students at the end of traditional instruction. Students' difficulties were identified in the pretests on the basis of responses and justifications. The average difficulty index and average discrimination index of the test are 0.40 and 0.498 respectively. The instrument is moderately difficult and excellent discriminator.

After the pretest the students were two groups viz. Experimental Group and Control group formed on the basis of random selection. During the experiments any data related to students who did not attend all activities, has been excluded from further analysis. As a result only data of 30 students' have been included in the analysis with each group of 15 students.

In Control group, instructors used traditional method for revision of topics. The topics were revised in four lecture hours. During the revision instructors also solved some additional problems which included some conceptual and qualitative problems.

In Experimental group, Multimedia package was used to revise the topics of Oscillations for four lecture hours. Also students from this group were allowed to use the package in the laboratory for two hours. For this purpose subgroups each of three students were formed.

When the instructions have been completed, a posttest has been carried out.

Multimedia Package on Oscillations: The Interactive multimedia package applied in experimental group has been prepared with the help of Microsoft PowerPoint®, pictures, video clips and C programming. The content of the Oscillations have been organized in the presentation which is in the form of four modules viz. Equilibrium, Linear SHM, Lissajou's Figures, Angular SHM. The text content in the PowerPoint slides is static as well as dynamic. Cognitive enhancement was maintained by using animations to figures and graphical representations to teach concepts that were inaccessible through the textbook due to the lack of the textbook's ability to show motion. Forward and backward button facilities have been used in each slide. Simulations have been hyperlinked at appropriate positions in each module. Multiple choice questions and quizzes have been added at the end of each module. The multiple choice questions are different than that used in OCT. Screenshot of PowerPoint slide is shown in Figure 1 and screenshot of simulation on spring-mass system is shown in Figure 2.

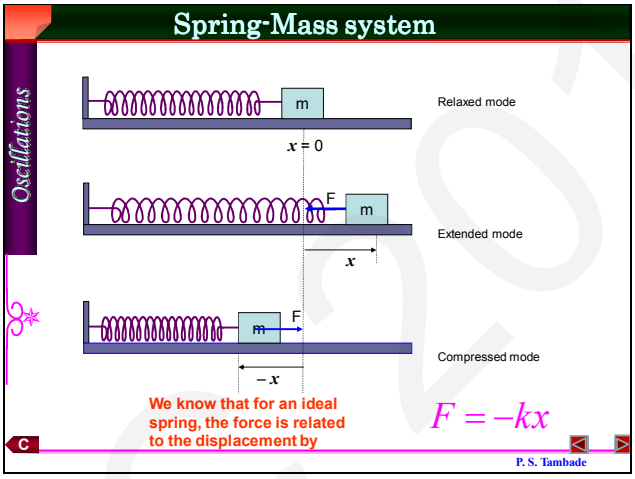

Figure 1: Screenshot of PowerPoint slide.

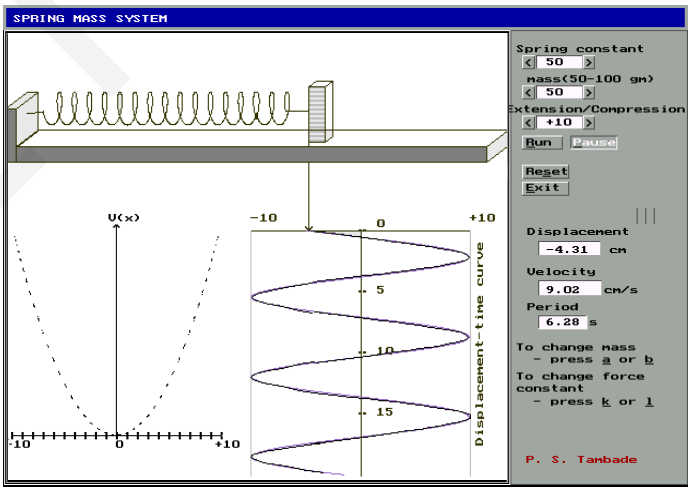

Figure 2: Screenshot of simulation of spring-mass system

RESULTS

Evidence for the effectiveness of teaching effectiveness aimed at producing conceptual change may be provided by initial and final assessments of students' conceptual understanding. Based on the data obtained by OCT, the students' mean and standard deviation for pre and posttest scores for two groups were obtained. The pretest scores are presented in Table 1. The independent sample t-test was used to determine whether there was a statistically significant mean difference between two groups for the pretest at 0.01 levels.

Table 1: t-test analysis of pre-test findings of two groups

Group	N	Mean Score	Standard Deviation	t (0.01)	p	d
Control	23	40.67	11.78	0.268	0.395	0.081
Experimental	23	39.67	13.43			

Table 1 shows t-test results of two mean scores of Group-1 and Group-2 at 0.01 significance level. Effect Size (d=0.081) and critical significance level $p > 0.01$ values indicates that there is no significance difference between mean scores in the pre-test. These results indicate that the subjects in the two groups that have participated in the research are equal in terms of knowledge according to their t-test results.

In order to investigate the effect of Multimedia approach on students' achievement on conceptual understanding about oscillations, a normalized gain g for each student was obtained by using the equation

g = **Hata!**

Class average normalized gain <g> with standard deviation was obtained for each group(Hake, 1998). According to Hake R. (1998), the treatment given to be interactive, if <g> is greater than 0.3. To determine whether there are any differences between two groups based on the average normalized gains, the calculated gains have been subjected to t-test analysis.

The post-test scores and average normalized gains are presented in Table 2.

Table 2: Post-test findings of groups

Group	N	Mean Score	Standard Deviation	<g>	S
Control	23	55.33	11.57	0.253	0.093
Experimental	23	75.00	14.88	0.604	0.201

(S = standard deviation for normalized gain for g)

The results of the analysis have been provided in the Table 3.

Table 3: t-test analysis of post-test findings of control group and Experimental group

Group	N	<g>	S	t – value (0.01)	p	d
Control	23	0.253	0.093	7.59	7.84×10^{-10}	2.29
Experimental	23	0.604	0.201			

Table 3 shows t-test results of class average normalized gains of control group and experimental group at 0.01 significance level. Effect Size (2.29) and critical significance level $p < 0.01$ values indicates that there is significance difference between normalized gains in the pre-test and post-test comparison.

This research showed the result that multimedia package in physics was pretty much more effective than traditional teaching in students' achievement in physics. The average normalized gain for Experimental group is greater than that of Control. Thus the treatment used for Experimental group is interactive and produces significant change in the conceptual understanding of students.

DISCUSSION

Present study found that many students have profound and meaningful difficulties with fundamental ideas and concepts not just in Oscillations but also of general ideas and approaches of physics that are often taken for granted in physics instruction yet which students must learn in our class. For example, many students were unable to functionally describe the meaning of a stable equilibrium and unstable equilibrium. Many students were unable to functionally describe the relationship between force and potential. Confusion between angular velocity and angular frequency, misinterpretation of instantaneous velocity and acceleration are some hurdles in the understanding of basic concepts in Oscillations. Many students have difficulty in differentiating between graphs of distance, velocity and acceleration with time and equate them all with a generalized idea of motion. When working with graphs students think that the graph is a literal picture of the situation and they confuse the meaning of slope of a line and the height of a point on the line (Saul, 1998).

It is observed that animations and simulations in the Multimedia environment helped the students to understand the graphical representations of displacement, velocity, and acceleration (Ubiña & Patricio, 2007). In simulations, students were able to change the variables and observe the effect. Using spring-mass system simulation and simple pendulum simulations, students were able to observe the change in velocity along the path of oscillator. Simple pendulum simulation helped the students to study effect of large angle oscillations on the period of simple pendulum.

Investigations showed that the students in Experimental group were better placed in interpretation of verbal, graphical representations, and diagrammatic representations in oscillations as compared to Control group. They are also more coherent in conceptual understanding as compared to their counter parts. It has been observed that multimedia improves student's success as well as develops high level of thinking abilities. Students learn the concepts by comprehension rather than memorizing (Kara & Yakur, 2008).

The results of this study shows that teaching of "Oscillations" performed with multimedia in the scope of Computer Assisted Instruction with cooperative learning is a more productive approach than the teaching performed with traditional methods in terms of improving the student success and concept understanding (Gonen, Kocakaya, & Inan, 2006).

CONCLUSIONS

This study found that the significant proportion of students in investigated sample had serious conceptual confusion to basic concepts in Oscillations, even though they had instructions in previous class also. These results are specific to the investigations in Oscillations, but the manner in which author found students unable to build a coherent conceptual and functional understanding of physics may cause problems in many other subjects.

In conclusion, present study has shown that computer-assisted instructions are an excellent way to focus students' understanding of principles in Oscillations. The use of the CAI improved the students' ability to make acceptable predictions and explanations of the phenomena in physics. The simulations used in the study are found to be good pedagogical tool as students could vary the variables and observe the effect. Findings of this study strongly support the fact that Computer animations and simulations may be used as an alternative instructional tool, in order to help students confront their cognitive constraints and develop a functional understanding of physics.

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ASSESSMENT OF SECONDARY SCHOOL TEACHERS' PROFESSIONAL DEVELOPMENT IN THE USE OF INFORMATION COMMUNICATION TECHNOLOGY FOR TEACHING MATHEMATICS IN EJIGBO, NIGERIA

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ABSTRACT

The study sought information on teacher professional development in the use of Information Communication Technology in teaching Mathematics. The population comprised secondary school teachers and r students in the study area. The sample consisted eight (8) secondary schools (three private and five public schools) using random sampling technique. Ten (10) teachers were purposively sampled from each school, which made up 80 Mathematics teachers while 122 students were randomly selected. The data collected were analyzed using frequency count, percentage and t-test statistics. The results revealed amongst others, that there was awareness among teachers and students on the use of Information Communication Technology (ICT) in teaching Mathematics at the secondary schools. There was no significant difference between the students mathematics achievement in both private and public secondary schools. Based on the findings, it was recommended that mathematics laboratory should be provided in the secondary schools to enable teachers and students improvise instructional materials that may not be readily available.

Key Words: *Profession, Teacher professional development, Ejigbo, Nigeria, Teacher Education, Information Communication Technology(ICT).*

INTRODUCTION

It is not an overstatement to say that mathematics is an indispensable tool in the march towards technological breakthrough. Mathematics cuts across all the fields of human endeavours in its wide application and mind development. However, despite its wide applicability, many students still could not find their feet in the subject. Governments and educational systems around the world recognize the need for students to be skilled, creative and confident users of a wide range of Information Communication Technology (Charalambous & Karagiorgi, 2002), of which the knowledge of Mathematics is required. To acquire the appropriate knowledge and skills required by students, teachers' professional development, have significant roles to play in the authentic application and sustenance of ICT in schools. It is imperative therefore, that due consideration be given to the nature of programmes, pre-service teachers are exposed to in their teacher education courses. The importance of ICT in national development cannot be underestimated. The ICT are electronic devices and techniques used in collecting, storing, retrieving, processing, presenting and transmitting data (Oxford Mathematics Dictionary, P.56). Similarly, the ENCARTA world English dictionary (2009) described ICT as the use of technologies such as computers,

electronics and telecommunication processes that distribute information in digital and other forms. Also, Thorpe, (2010) referred to ICT as the use of digital media and the internet. In the same vain, Ogunlade (2008), submitted that, the adoption of ICT in education would arouse a new interest among students, educators and educationists and possibly influence, if not change the attitude of teachers and students to learning. ICT in education would also promote global interaction and sustainable development.

The greatest challenge confronting the contemporary Nigeria society is the rapidly changing technology which requires adequate knowledge of mathematics. This is because without mathematics there is no science, without science there is no modern technology and without modern technology there is no modern society. (Ale & Adetula, 2009).Maduakolam and Bell (2003) revealed that the problem militating against the use of existing and emerging technologies by pre-service and servicing teachers is the inability of the training institutions to integrate the required knowledge and skills into instruction and across curricula. This justifies the reason for adequate training of teachers on the use of ICT-based instructional strategy because it is one of the new teaching approaches that have been proven to be effective in the area of learners' active interaction with the learning material. Thijs, (2002) identified the benefits of ICT-based instructional strategy against the traditional method among others as: (i) a medium that provides learners the opportunity to work with people from different cultures, thereby helping to enhance learning and communication skills as well as their global awareness. (ii) Encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Also, Greece, (2010) affirmed that ICT-based instruction promotes student-centered learning. It was further explained that it focuses on students' needs, abilities, interests, and learning styles with the teacher as facilitator of learning.

In Nigeria, more have to be done in the area of professional development in the use of ICT among secondary school teachers. Teachers have not been given expected opportunities, only few of them have been going through self development in ICT, some of them that cannot afford the exorbitant cost of training, have indirectly resulted to fate which should not be. The quality or value of teachers could be determined by their abilities to cope with innovations in teaching and learning. It is therefore imperative to occasionally ensure teachers' personal development and career advancement both in their subject disciplines and in teaching profession. This informed the assessment carried out by the present study on professional development of teachers in Ejigbo in their use of ICT in teaching Mathematics.

THE PROBLEM

The rapidly changing technology has implication for teaching and learning since education is the only channel through which the beneficiaries can get awareness. The knowledge of mathematics is required by all users of technologies and that is why it is one of the core subjects at the primary and secondary school levels of Nigeria education system. In spite its importance, the annual chief examiners' reports on students' achievement

in mathematics had not been favourable. Table 1 shows the trend of achievements for six consecutive years.

Table 1: Trend of students' achievement in West African School Certificate Examinations from 2005-2010.

Year of Entry	Total Entry	Total Sat	Pass at Credit level	Ordinary Pass	Failed
2005	1080133	105453	402982	267600	363055
		97.11%	38.20%	25.35%	34.41%
2006	1170137	1249028	584024	357325	286826
		98.33%	46.75%	31.09%	24.95%
2007	1270136	1249028	584024	333844	302774
		98.33%	46.75%	26.72%	24.95%
2008	1292890	1268213	726398	302266	218618
		98.09%	57.27%	23.83%	17.23%
2009	1373009	1348528	634382	344635	3369511
		98.22%	47.09%	25.56%	23.79%
2010	1351551	1351557	534841	677007	139709
		99.94%	39.51%	50.09%	10.34%

Table 1 show that less than 50% of the examinees made a credit pass in mathematics and are qualified for admission into the university or other tertiary institutions. The only remarkable year with 50%credit pass was 2008 which is still worrisome when compared with the previous and subsequent years. The question is that; what happens to the remaining larger percentage?

Figure 1: Graphical representation of students' achievements in West African School Certificate Examinations from 2005-2010

Figure 1 show the bar graph of the % that registered, the % that sat for the examinations, the % that passed at credit level, those with ordinary pass and failure in each year respectively over a period of six years (2005-2010). The bar chart also indicated the highest percentage of students that passed at credit level in the year 2008.Research reports have identified teachers' methods of delivery as one of the major responsible factors for inadequate performances in the subject. The traditional didactic method is no longer adequate to meet the demands of mathematics education (Salman, 2010). Replacing the traditional mode of instruction with the use of computer and the internet source provider would widen students' access to topics and scope to learning (Wikipedia, 2010). It is the recognition for the use of electronic devices for teaching and learning of mathematics to enhance performance and cope with the technological advancement that led to the introduction of computer education in to the secondary school Mathematics curriculum. Chong Checkeong, Saraf Horani and Jacob Daniel (2005) reported that after the Malaysian Ministry of Education had implemented the use of Laptops in the teaching of Mathematics and science since 2003, it was observed that teachers are not fully utilizing these facilities in their teaching. This may be due to the ministry's failure to ascertain the teachers' professional development in the use of laptops.

In the same vein, three states (Kwara, Kano and Kaduna) in Nigeria embarked on three (3) years project from 2007 to 2011 on Professional Development of which Teacher Professional Development (TPD) is a component. The main purpose of the Teacher Professional Development was to improve teaching and learning in schools by encouraging teachers to adopt "Learner-centered" approaches in their classrooms. Series of workshops were organized for the following people: supervisors and inspectors; head teachers and principals; and finally classroom teachers drawn from the basic level of Nigeria Education System. There were face-to-face workshops, school visits and cluster workshops on teaching of English (First Year), Mathematics and science (2nd year) and social studies (3rd year). The use of ICT was not emphasized in the subjects' modules; include Mathematics in the professional development but how learners can be actively involved in class activities. In the same vein, secondary school teachers in Ejigbo, between 2004 and 2007 took part in workshops on professional development, specifically on ICT. Though only few of the teachers took part in the workshops. The present study therefore, sought information on whether or not the professional development opportunity on the use of ICT for instruction enjoyed by secondary school teachers in Ejigbo, Nigeria, had impact on the performance of their students in Mathematics.

STUDY PURPOSE

The major thrust of this study was to assess secondary school teachers' professional development in the use of information communication technology Mathematics in Ejigbo, Nigeria. Specifically the study focused on the following:

1. Awareness of secondary school teachers' professional development in the use of ICT for teaching Mathematics.
2. Professional development skills of teachers in the use of ICT for teaching Mathematics
3. Teachers use of ICT in public and Private Secondary Schools
4. Compare students' achievement with Teachers' professional development skills in the use of ICT for teaching Mathematics.

RESEARCH QUESTIONS

Based on the purpose of the study, the following questions are raised

1. Are secondary school teachers in Ejigbo aware of the use of ICT in teaching Mathematics?

2. What is the assessment of secondary school teachers' professional development skills in the use of ICT for teaching Mathematics?
3. Is there any difference in teachers use of ICT in public and Private Secondary Schools
4. Does teachers' professional development in the use of ICT for teaching mathematics have impact on students' achievement in Mathematics in private and public secondary schools?

HYPOTHESES

Research questions 3 and 4 are now Hypotheses one and two.

Ho_1: There is no significant difference in teachers' use of ICT for Mathematics teaching in secondary schools in Ejigbo.

Ho2: There is no significant difference in achievement of students taught with the use of ICT for teaching Mathematics in private and public secondary schools in Ejigbo

LITERATURE REVIEW

It has been observed that every field of science and technology has substantial mathematics content though of different degree. Okereke (2006) described the functional role of mathematics to science and technology as multifaceted and multifarious that no area of science, technology and business enterprise can escape its application. Okigbo and Osuafor (2008) attributed the poor performances to the fact that the most desired technological, scientific and business application if it cannot be sustained. Also Marwaha (2009) identified teaching mathematics as an abstraction, removing it from application, treating it as a subject not relevant in other school subjects, placing much emphasis on symbol and manipulation with little attention to problem solving, as reasons why students do not fair well in mathematics. In the same vein, Srinsvasa (1978) and Ogunkunle (2000) identified non-use of laboratory approach which is practical oriented and also involve the use of computer and the internet (ICT) as major factors that contribute to poor achievement in mathematics particularly by secondary school students. The integration of ICT to the teaching of Mathematics is a great challenge to secondary school teachers in Nigeria because the teacher training institutions that are supposed to be driving force towards the implementation of ICT in teaching school subjects are not adequately professionally empowered in effective utilization of ICT.

METHODOLOGY

Research Type

The study was a descriptive survey which involved administration of questionnaire to the respondents and assessment of students' performance in Mathematics. It involves prepared questionnaire and performance test which were used to collect data.

Sample and Sampling Techniques

The population of the study comprised all the secondary school Mathematics teachers and their students in Ejigbo Local Government area of Osun State, Nigeria. Eight (8) secondary schools were selected as sample through simple random sampling technique. Eighty(80) teachers and One hundred and twenty two(122)students were chosen from the sampled schools through purposive sampling technique. Table 2a shows the selection of teachers based on qualification and subject specialization.

Table 2a: Frequency count of respondents according to qualification and subject specialization

	Subject Specialization		
Qualification	**Mathematics**	**Others**	**Total**
N.C.E	10	15	25
B.Sc., Graduate/ H.N.D	20	25	45
M.Sc./M.Ed.	-	10	10
Total no Selected	30	50	80

Table 2b: Frequency count of selected schools

School Type	Number
Private	52
Public	70
Total	122

It is indicated in table 2a that out of the eighty teachers purposively selected; only 30 were specialized in Mathematics while the remaining 50 were not experts in Mathematics but were asked to teach the subject. This has strong implication for students' performance in the subject.

INSTRUMENT

Researchers-designed questionnaire and a performance test were used as the main instruments for the study. Oral interview and checking of relevant materials in the schools also provided additional information. The instruments were designed to assess the awareness of ICT, availability of ICT materials for mathematics teaching and learning and utilization of ICT in teaching mathematics. Each questionnaire was divided into 3 sections. The first section sought information on students' and teachers' personal data, section 2 consisted Yes/No responses from teachers and student for teacher use of ICT to teach mathematics. The last session contained open ended questions for teachers and students separately to check for awareness of ICT for teaching mathematics and professional development. The performance test was administered on the students.

VALIDATION

The questionnaire was given to educators, experts in mathematics education and educational technologists, research methods specialists for comments and guidance. The questionnaire forms were given to experts also for validity, 20 questionnaire copies were administered in some schools outside the sample to test for reliability. The reliability was thus tested through test re-test method using spearman rank correlation. The correlation value of 0.98 was obtained.

ADMINISTRATION

The researchers administered the questionnaire in the 8 selected schools (Private and Public). The administration of the questionnaire was done by the researchers to ensure prompt response and high rate of outcome. All the 80 copies of the questionnaire given to mathematics teachers were filled and returned to the researchers. Also the 122 copies of the tests administered to students were also returned.

DATA ANALYSIS AND RESULTS

The data obtained from the questionnaire was analyzed using frequency count and percentage, while t-test analysis was used to test the null hypotheses generated.

Results

Research Question One: Are secondary school teachers in Ejigbo aware of use of ICT in teaching Mathematics.

Table 3 Teachers awareness of ICT

Table 3: Frequency counts and percentages on teachers' awareness of ICT

Items	Statement	No of Yes Responses	% of Yes Responses	No of Responses	% of No Responses
1	I have been aware of ICT	50	62.5	30	37.5
2	I have no knowledge of ICT	35	43.75	45	56.25
3	I am not aware that ICT is an instructional strategy for teaching Mathematics	36	45	44	55
4	I am aware that computer is a component of ICT	50	62.50	30	37.50
5	I have attended series of seminars which increase my knowledge of ICT	10	12.50	70	87.50
6	I am aware that palmtop performs the same function with desktop.	10	12.5	70	87.50

On Mathematics teachers awareness of ICT 62.50% of the teachers claimed that they have been aware while 37.50% have not been aware. Also on the knowledge of ICT, 43.75 claimed to have the knowledge while 56.25% have not acquired the knowledge. Result also showed that 45% were aware that ICT is an instructional strategy for teaching Mathematics, 55% were not aware of such fact.62.5 respondents claimed that they were aware that computer is a component of ICT while 37.5% were not. Among the sampled teachers 12.50% of them had attended seminars which increased their knowledge of ICT, 87.5% were on the negative. Moreover from the same table, majority (87.50%) claimed that they were not aware that palmtop performs the same function with desktop, which implies that mathematics teachers' awareness would have to be worked on.

Research Question Two: What is the assessment of secondary school teachers' professional development in the use of ICT in teaching mathematics? This question was answered using frequency count and percentage. Table 4 shows the responses of Teachers on use of ICT in teaching Mathematics.

Table 4: Frequency counts and percentages on teachers' use of ICT and related Instructional materials

Items	Statement	No of Yes Responses	% of Yes Responses	No of Responses	% of No Responses
1	Do you use ICT- based materials in teaching topics in mathematics?	52	65	28	35
2	Are the textbooks used for your students in teaching mathematics adequate such that you don't need ICT tools?	35	43.75	45	56.25
3	Is your school library well equipped with the latest ICT Tools for use in the preparation of lesson?	36	45	44	55
4	Do you normally use computer to teach your students?	20	25	60	75
5	Would you allow the use of calculator in your mathematics class?	50	62.50	30	37.50
6	Do you give your students assignment on the internet?	10	12.5	70	87.5
7	Is there any mathematics laboratory where you engage your students in practical activities?	15	18.75	65	81.25
8	If there is a mathematics laboratory in your school are they well equipped with ICT tools?	10	12.5	70	87.5

On the use of ICT related materials in the teaching of mathematics 65% of the teachers claimed that they were always using them. Also on the adequacy of the available textbooks used for mathematics teaching, the result showed that they were not adequate because 56.25% gave negative response. On item 3, 55% of the respondents, claimed that schools in Ejigbo lacked well equipped library where they can lay their hands on relevant ICT tools. On the use computer for Mathematics teaching, 75% of the respondents claimed that they have not been using such for teaching Mathematics. Also 62.50% indicated that there was nothing like use of calculator in their mathematics classes. On the use of internet, 87.5% indicated, that they were not giving their students assignment on the internet. In item 7, 81.25% claimed that their schools had no mathematics laboratories. Finally, 87.50% of the sampled teachers indicate that the available laboratories were not well equipped with ICT tools. This implies that mathematics teachers would have to teach the students without relevant ICT tools in the schools.

HYPOTHESES TESTING

Ho_1: There is no significant difference between the teachers' use of ICT in both public and private secondary school. This hypothesis is equivalent to research question 3. This was analyzed using t-test

Table 5: t-test analysis on teachers' use of ICT for teaching Mathematics in Private and Public Secondary Schools. In Ejigbo

School	Mean	SD	N	df	t_{cal}	t_{tab}
Private	62.55	9.77	40	120	0.17	1.67
Public	62.18	10.27	40			

The t-calculated of 0.17 is less than the table value of 1.67. It means that there was a significant difference in teachers' use of ICT for teaching Mathematics in private and public secondary schools at 0.05 significant levels. Hence, the hypothesis was hereby rejected.

Ho2: There is no significant difference in performance scores of students taught Mathematics with the use of ICT in private and public secondary schools in Ejigbo

This hypothesis is also equivalent to research question 4.This was tested using t-test statistic.

Table 6: t-test analysis on the impact of ICT on students' achievment in Mathematics

School	Mean	SD	N	df	t_{cal}	t_{tab}
Private	19.13	7.94	52	120	8.34	1.98
Public	17.79	7.37	70			

Table 6 shows t-test analysis on secondary school students' mathematics achievement scores. The null hypothesis (Ho_3) postulated that there is no significant difference in students' mathematics achievement scores in private and public secondary schools. It is indicated in the table that the calculated value of 8.34 is greater than the critical or table value of 1.98. In other words there no was significant difference in the achievement scores of students in private and public secondary schools in Ejigbo at 0.05 alpha level of significance.

DISCUSSION OF FINDINGS

The findings from the study reveals that out of the 80 secondary school teachers that participated in the study, thirty (30) teachers specialized in mathematics while 50 teachers were in other areas of specialization but their school authorities allowed them to teach mathematics. In the selected schools, only 37.50% of the teachers indicated that there was mathematics laboratory in their schools which would have assisted the use of ICT. Also, a reasonable number affirmed that they have not been having opportunities of attending seminars and workshops on ICT which would have increased their awareness of ICT. An important observation made by the researchers in the scoring of students' answer scripts was the in ability to correctly interpret word problems into equivalent equations. This is consistent with the finding of Marwaha (2009) who reported that teachers place emphasis on numerical problems that involve the use of symbols and manipulations, with little attention to problem solving involving word expressions.

It was also revealed that the secondary school teachers under study were aware of ICT tools and its use for teaching mathematics but there was a significant difference in its use by teachers in private and public secondary schools. The teachers expressed their concern about the high cost of ICT tools which they are not capable of purchasing except the government can subsidize. In other word, teachers at the secondary school level are still lagging behind in modern technological modes of instruction. The significant difference in the use of ICT by teachers in private and public school could be attributed to efforts by private school to adequately equip their schools for purpose of patronage. The non significant difference in the achievement of the students implies that the use ICT for teaching Mathematics did not have impact on their achievement. For effective use of ICT for teaching and learning both the teachers and the learners must be cognitively and affectively prepared to embrace the innovations in teaching and learning particularly in the use of ICT for classroom instruction.

CONCLUSION AND RECOMMENDATIONS

Effective integration of technology in the classroom stimulates students and teachers in attempting more complex tasks and materials. Mathematics teachers may want to use technology in this manner to develop higher expectations for their students ICT will equally enable students to engage in content areas, activities that are challenging and also collaborative, cooperative and interdisciplinary studies.

Based on the outcome of the research the following recommendations are considered relevant: As confirmed in the present study, the value for the use of ICT in schools in Nigeria is still limited to private and unity schools and few public secondary schools. For all schools irrespective of the type, to go on ICT-based instructional strategies, a lot of money would be required because it is capital intensive.

Awareness of its importance should be created for mathematics teachers in public secondary schools in particular and teachers in general through organized workshops. The effective use of ICT in teaching Mathematics at the secondary level requires human ware such as: Computer operators, programmers, analysts, engineers and trainers that would assist in training and retraining of mathematics teachers who will impart knowledge and skills to learners. The government should give necessary financial support required to get the required human ware and the necessary materials.

Pre-service and service mathematics teachers should be sent on intensive training course of one year or six months or three months on ICT knowledge and skills.

Mathematics laboratory should be provided in secondary schools to enable teachers and students improve on teaching and learning respectively particularly in the practical use of ICT tools.

Institutions responsible for curricula development and teachers' development should collaborate on the alignment of teacher development programmes and integration of the use of ICT in mathematics and science education.

Curriculum developers of programmes teacher education should develop instructional plans across board and the applications, to facilitate the integration of the use of ICT in teacher professional development in mathematics.

The relevant Government should be ready to provide ICT tools and ICT training for teachers so that mathematics teachers will be able to have positive influence on their students.

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BACKGROUND KNOWLEDGE ON NATURAL DISCIPLINES IN TEACHING COMPUTING DISCIPLINES

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ABSTRACT In an undergraduate teaching/learning process of computer disciplines, the role of background knowledge of students on natural disciplines (especially on mathematics) is fundamental. In developing countries, such as Turkey, in many cases its level is quite lower than those of the developed countries because of different causes (traditional, local, high school education characteristics etc). As a result students have difficulties in understanding of the teaching material, designing algorithms and programs. The weaker the background knowledge of the students the higher the negative effects of the diversity to the learning process. Attempting to promote the background knowledge can allow to lessen this effect. One way to improve on a background knowledge is to include the main concepts of related mathematical (physical, chemical) topics into the lecture material of a computing topics for recalling purposes. This can allow students to fit this gap at least partially in their background knowledge and cause the learning process to be more effective. This paper considers these problems and describes the results of the experiments held at the Anadolu University, Turkey.

KEYWORDS : engineering education, computing disciplines, teaching of programming, mathematics in programming languages.

1. INTRODUCTION

Programming is a fundamental discipline in the study of Computer Engineering at Higher Education Institution worldwide. How to teach programming is well known – necessary material fits into a course over two or three semesters (the term “programming” hereby means some introductory computing material such as Introduction to Computer Engineering, First Programming Language, Data Structures). Usually the teaching programmes are oriented towards a student with a generelized mid-level background that in many cases is not rightly defined and founded. This is so for developed countries. In developing countries, such as Turkey, the same teaching programmes are used as they are in developed countries or with little modifications. But a mid-level background knowledge of students on natural disciplines is quite low in these countries compared to developed countries. Following the same programmes, lecturers are typically faced with situations of difficultes in teaching and learning processes. Because of their weak theoretical background, students usually have difficulties in selecting a suitable mathematical method in designing an algorithm to solve a given problem. To fill this gap, it will be useful to recall the related mathematical items briefly (in many cases items are simply forgotten) before the programming topic is taught. In this paper these problems are discussed and some thoughts are provided on how the changed lecture content might affect the quality of the learning process.

2. ON UNDERGRADUATE PROGRAMMES IN COMPUTNG

Two of the expected outcomes for an undergraduate curriculum in software engineering according to [1] are that graduates of this programme must be able to

-understand and be able to apply current theories, methods and models that provide a basis for software design and development;

-learn new models, techniques and technologies as they emerge.

But this is not sufficient, it also requires students to utilize concepts from a variety of other fields, mainly from mathematics. Computer engineering students must learn to integrate theory and practice, be able to select The theoretical and conceptual foundations of computer science play the main role to satisfy these requirements. corresponding mathematical concepts, methods, techniques and convert them to a form suitable to solve specific problems, to recognize the impotance of abstraction and modeling, to be able to acquire specific domain knowledge beyond the computing discipline to support development in specific domains of application.To maintain these and other requirements a set of recommendations are performed in the undergraduate programmes in computing [1]. Generally the software engineering curricula concentrates on the knowledge and pedagogy. The term "knowledge" is used here to represent the wide spectrum of content for the discipline, such as terminology, methods, models, practices, literature etc. Education knowledge is organized hierarchically into three levels: areas, units and topics.The area represents a particular subdiscipline of software engineering that is generally recognized as a significant part of knowledge that an undergraduate should know. Units are a smaller divisions of an area which represent individual thematic modules. Each unit is further subdivided into a set of topics, which represent lowest levels. Here is an example:

Area: Fundamentals.

Unit: Computing foundations.

Topic: Programming language basics.

Then it is tried to define a metric that establishes a standart of measurement to judge the actual amount of time required to cover a unit. An hour is taken as an unit that corresponds to the actual in-class time using in a traditional lecture-oriented format. But there are some doubts to the usage of lecture hours as a measure. The time in hours assigned for each unit in some cases is not enough to enable students perform the learning objectivies for that unit. It is always appropriate to spend more time on a unit than the mandated minimum. In the following chapters of the text we will discuss one approach to argue this assumption.

3. MATHEMATICAL TOPICS IN PROGRAMMING

In computer engineering programmes in many universities around Turkey and in another countries, the teaching of mathematics has generally been traditional for many years: the main focus is on analytical solutions to simplified mathematical problems [2] without explanations on how they can be used in practice. In many cases lecturers are from mathematical departments and they are teaching engineering students in the same way as students of their own departments. In these courses much more teaching time is usually spent to prove theorems and to solve simplified numeric examples by hand. Many mathematical topics that are necessary when teaching an introductory programming course are taught at a high school or are taught in parallel with programming disciplines in the beginning semesters at a university. As a result, the knowledge is either forgotten or is not completely understood yet. Students are faced with difficulties in selecting a mathematical method or using it when designing a particular algorithm.

A corresponding mathematical topic can be taught briefly before a programming topic is taught. And the structure of a teaching material and pedagogical approach can not be the same as in the case of mathematicians. Here a computer lecturer can use his/her own pedagogy and teaching manner focusing on applications of the methods.These are done not for all topics of a programming language but for a special set of topics defined by a lecturer based on an existing background knowledge of a particular student group.This will require an additional lecture time of about 20-30 min.

4. COMPUTING TOPICS AND RELATED MATHEMATICAL TOPICS

Some topics of mathematics directly influence the learning process at the beginning stages of an introductory programming teaching. Recalling related mathematical concepts – their formulas, rules for manipulating, knowledge about their application areas etc. enables students use them efficiently in designing algorithms and programs, and causes them to deal with mathematical textbooks to search for the best methods and formulas, which increases the amount of the background knowledge. Which topics should be taken and which details should be recalled depends on the level of the existing background knowledge of a particular group of students, and can be defined by a lecturer. The following topics would be useful in many cases when students have a weak background knowledge in mathematics.

. Series

Having a good knowledge on mathematical series is necessery for computer engineering students both during their university lifetime and in their postgraduate activities.Recalling and memorizing the following items are desireable when teaching/learning iterative control structures of a programming language:

- the general form of the summation formula: $\sum_{i=1}^{n} a_i$, basics of divergent and convergent series, manipulating and bounding summations;
- types of series: arithmetic, geometric, harmonic, telescopic;
- how to deal with a difficult summation when defining boundaries that describe the running times of algorithms;
-basics of the mathematical induction techniques when designing algorithms to evaluate complex series.

. Relations and functions

A subprogram mechanism is one of the fundamental concepts of a programming language that can be understood and learnt attentively. The background knowledge on mathematical relations and functions can have a good contribution here. Items are:

- philosophy of relations, binary relations, equivalence relations and partitions, orderings;
- functions and function types (relational, exponential, logarithmic, trigonometric etc);
- function notations (prefix, infix, postfix);
- functions in a complex computing.

. Algorithms

Before starting to learn how to program a student must have sufficient representation on conceptual and theoretical foundations of algorithms. The following questions are important here:

- what is a computational procedure (well-defined and others);
- what is the role of algorithms in the problem solving;
- methods to represent algorithms (natural language, mathematical and graphical forms);
- algorithm correctness and ability to solve a particular problem;
- algorithm complexity basics, importance of understanding hard problems;
- basics of algorithm design techniques.

5. EXPERIMENTS

In the educational year 2007-08 at the Computer Engineering Department of Anadolu University, Turkey, for the group of 32 students the traditional teaching process was slightly modified using ideas descussed above for four topics of two computing disciplines. Two topics were from the introductory programming language C, and two other – from the course Data Structures and Algorithms. The related mathematical topic (topics) was recalled before a computing topic was started to be taught. Recallings included a brief explanation of the analytical foundations of the topic, and how the formulas could be converted into a discrete form suitable for use in algorithms. The computing topics and the related mathematical topics were:

1. Iterative control structures : Arithmetic, geometric and harmonic series, nature and features of Taylor and Maclaurin series. The principles of mathematical induction techniques when designing algorithms to evaluate complex series were explained later when working on homeworks.
2. Functions: Mathematical relations and functions, notations for representation, types of functions, role functions in programming.
3. Linear data structures: Nature and notations to represent linear relations, equivalence relations and partitions, ordering techniques.
4. Nonlinear data structures: Graphs as an abstraction to represent complex problems, notations, simplest graph types, basics of graph representation and searching strategies.

The results of the experiment appear in Table 1.

The table contains the results of the final exams for two consecutive educational years for four topics discussed. In the 2006-07 year computing topics are taught in the traditional way whereas in the 2007-08 – using lectures with modified contents. The experiment was provided for two groups each of 32 students assuming that estimated values of the general characteristics (a level of background knowledge on natural disciplines, features of motivation and aptitude etc.) were nearly the same for both groups.

We observed the exact differences between results of two years: the total number of students with FF-grades is decreased (-37%), the number of students with CC-grades are approximately the same (+8%), and for AA-grades there is the significant growing trend (+63%).

Table 1. Exam results of two student groups in 2006-07 and 2007-08 years.

FF stands for the grades of 0-50, CC- for 51-70, and AA- for 71-100.

	2006-07			2007-08		
Topics	FF	CC	AA	FF	CC	AA
1	14	15	3	8	16	8
2	12	13	7	7	16	9
3	11	12	9	8	12	12
4	15	14	3	10	15	7
Avg	13	13.5	5.5	8.2	14.7	9
%				-37	+8	+63

For students of the 2007-08 year the following positive observations was also recognized:

- to have a need to look at the mathematical textbooks frequently;
- to have an interest whether is there another method to solve a particular problem;
- to wonder which technique is more suitable for solving the problem in terms of algorithm understandibility and program simplicity.

During the educational year it was also possible to use more complex problems in laboratory trainings and homeworks.

6. CONCLUSIONS

There is a vast amount of research on educational process, but we generally know little about how students are learning. It is clear that different students learn in different way [3] . So- called “surface learners” simply scrape the material without carrying out any deep processing, whereas “deep learners” make a serious attempt to learn a material completely, understand its details and turn the ideas into their own knowledge structure.

Some another factors also influence the learning process. They are related to the student diversity factors: physical (age, gender, ethnic bacground), a prior educational experience (learning skills, preferred learning styles, “life skills”), expectation, motivation and aptitude [4]. Dealing with such diversity, different strategies and methods (pedagogical, experimental etc.) can be used to organize teaching/learning processes. And for different disciplines these strategies and methods can also be different.

For computing disciplines one factor – students’ background knowledge on fundamental disciplines (especially on mathematics) plays the leading role: the weaker the background knowledge of the students, the higher the negative effect of the diversity to the learning process. Attemts to promote the background knowledge can allow to lessen this effect at least partially. One way to improve on a background knowledge is to include related mathematical topics into the lecture material of a computing topic for recalling purposes. The term “recalling” here means to repeat briefly (or to teach if the topic is not taught before) analytical basics of a mathematical topic focusing on its application posibilites and formats necessary for using it in algorithms. And the amount of

lecture time will last for about 30 minutes. The experiments held at the Computer Engineering Department at the Anadolu University show that the general characteristics of a teaching/learning process are improved. Experiments will be continued for other computing disciplines. Modifying the contents of recalling topics, developing suitable pedagogical approaches are among the problems to be examined in the future investigations.

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BEST OPPORTUNITIES IN PATIENT EDUCATION

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Patient education is about empowering patient with a relevant health knowledge and skills to carried out certain practices to avoid diseases and its possible consequences. It is not about identifying and delivering the best educational tool, it is about the appropriateness of the tool in relation to its users. It is a dynamic process that should be centred at enabling patient to gain further insight about his or her health. The task of educator is to sense and response appropriately towards that. Failure to sense those cues means failure to make use of the opportunity. Therefore the strategy in patient education is not about "what's needed by the educator", but more towards "what's needed by the patient". This paper highlights some of the educational-learning opportunities in hospital setting where the educators are given the best chance to enter and to influence their patient's mind.

INTRODUCTION

Education is about empowerment - empowering people with a relevant knowledge and skills to conduct certain favourable practices (Newbold PA, 2010). In patient education, it is about empowering patient with a relevant health knowledge and skills to carried out certain healthy habits in order to avoid diseases and its possible consequences and more importantly is to narrowing the gap (Khalib Al and Farid AR, 2010). According to Eriksson M and Lindstrom B. (2008), it is a favourable "salutogenestic" flow from health knowledge to healthy practice and biological wellness - a fundamental principle of an effective health education and health promotion activities.

Failure to achieve this task, it may indicates the failure of the educational-learning activities (Armstrong AW, 2010). Obesity for instance, it is not about overeating of unhealthy food or lacking of engaging with physical activity, it is about failing of empowering people with an appropriate knowledge and skills about avoiding overeating or participating in physical activity. Untreated obesity may result with other sequences such as hypertension, diabetes, coronary heart diseases, stroke, heart failure or even premature death (Geetha L et al, 2011 and Cha E et al, 2010).

If education is assumed to be the best strategy to avoid diseases or to reduce prevalence of the diseases, then its methodologies and activities need to be properly instrumented and managed. It is not about identifying the best educational tool to be used, it is about the appropriateness of the tool in relation to its users. It is important that all parties be sensitive to the educational need of its client and always careful when making a prescription (Tarn DM and Flocke SA, 2011).

In medical field, health education should not be instrumented at the level of awareness only, it should be advanced beyond that. It is a dynamic process that centre at enabling people as well as patient to gain further insight about his or her health. Thus, its final outcome should be adopting or conducting certain healthy habit to avoid certain related diseases, to minimize certain related consequences and promoting the healthy outcomes (Von Ah D et al, 2004). As an educator, a comprehensive approach is needed. All educational opportunities must be observed and be utilized towards patients' real empowerment.

Strategy in Patient Education: The True Meaning

Laterally, strategy in patient education can easily be understood as communication methods. It can be direct communication method – the conventional method that commonly associated with face-to face and its related educational process, counselling, consultation, health talk, bed-site education and instruction session; or indirect communication method or via the mediator - the use of media, educational technology, relatives or others influence people.

The philosophy of patient education is not about free delivering of the available strategies and/or communication methods, it is more towards how the best available method be instrumented to the given opportunity. It involves identifying the most appropriate opportunity, selecting and managing the best communication method (direct or indirect) and transmitting the best educational content (see **figure 1**).

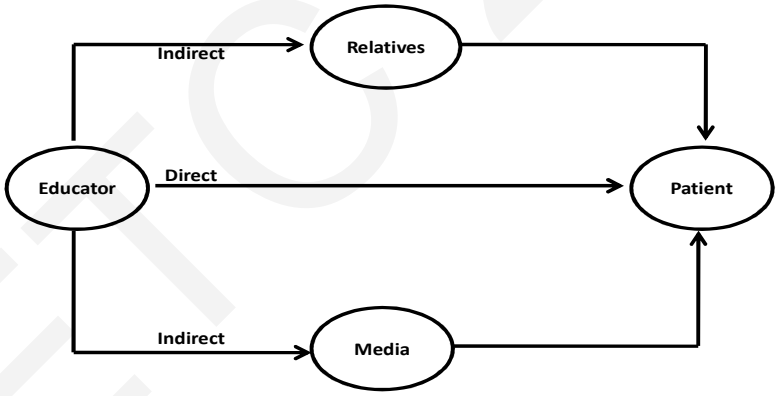

Figure 1:

Patient education is about selecting and managing direct and indirect educational methodologies for the healthy practices

Opportunity is about its capability to exhibit an entrance for an education. As there are a lots of favourable opportunity in the hospital system, then it is the duty of the educator to differentiate of those considered the most appropriate and those considered the least. Therefore the strategy in patient education is not about "what's needed by the educator", but more towards "what's needed by the patient". Failure to sense those cues means failure to make use of the opportunity.

THE BEST OPPORTUNITY

The best opportunity is defined as any pleasing condition that can facilitate an educational-learning activities. It is an occasion where the educator cum the manager is given the best chance to influence their patient educationally. The good educator should not only capable to identify those cues but more importantly he/she should also be able to choose the most appropriate method to transmit an educational input into the patient's mind.

There are at least three main opportunistic areas can be focused namely the patient's situation, the timing of consultation and/or the setting.

a. Patient's Situation

This is about various opportunities that are existed or displayed within patient. It is the best chance where an educational advice is essentially easy to complied. Good example is the stage of the disease. Many studies have proven that adherence and compliance to treatment is correlated strongly with the stage of the disease. The more advance the disease, the more likely patient is adhered to the educational input. This can easily be understood as the need to get out of the illness and confidence about curing is quite overwhelmed (Lau-Walker M, 2006).

Patient's socio-demographic characteristics is another most notably opportunity as there are already proven perquisites in any educational approach. It reflects their underlying literacy level. Evidences have explicitly supported that certain socio-demographic characteristics are quite responsive to change. For instance, women are generally more receptive compared to men (Furuta M and Salway S, 2006). In fact, the different may also be seen among rural folks against urban citizen, educated versus non educated patients, old people against youngsters, marital to single and patient from developed countries against developing world. When it is in combination, the opportunity to educate is much more easier.

With regards to psychomotor aspect, which is about stage of patient's emotional feeling that is normally swinging as a result of patient perception about their illness, the responses are varied. It depends on the stage the emotion is being portrayed. It indicates the readiness for education. According to Lee F, (2007), patient tends to comply and will not complained when they are satisfied. Energetic listening, participating in communication viz providing feedback and questioning, smart dressing, freshness presentation, serious looking, punctuality, and positive attitude change may indicates of favourable emotion are all the cues of emotionally ready. Those who are appearing pleasing, are normally quite receptive compared to those who are emotionally unstable.

Other areas such as the existing of disease and co-morbidity are also proven situation and thus a good detrimental for education.

b. The Timing of Consultation

Consultation or counselling is known the best opportunity for education. It is an intimate moment where both patient and doctor (as an educator) are ready to interact

reciprocally. It is the time where patient is in great need to be cured and get out their suffering. Patients are normally easy to be persuaded just through a very simple approach and using the emotional touch.

It is more evidenced in the procedure room where some form of light communication moment can also be incorporated to ease the phobia. Time of examination and monitoring activities in the laboratory, radiological examination room, delivery or labor room, gastroscopic center and other hospital facilities are good opportunity for the educator to passed its educational message to the patient (see **figure 2**).

Opportunity to educate is also effective when patient is in great comfort (Lee F, 2007). This is obvious when patient is still fresh in the morning and lonely in the evening. Extra care must be exercised not to disturb patient when they are exhausted, physiologically uncomfortable such as hungry, full bladder, sleepy and specifically for women, their "embarrassment" moment, such as excessive wet of having heavy period and period pain.

Figure 2:
Mammogram procedure is the best timing to educate patient about breast cancer

Sometimes the unplanned meeting moment such as in the cafeteria, gymnasium and other communal places can also be a best timing to transmit an educational message. Through a very simple talk and joke, the message can easily be passed out in a very friendly conversation.

c. The Hospital Setting

This is about the existing facilities in the hospital system that potential to be upgraded as an educational media. Those facilities include the communal places such as hospital entrance, lobby, prayer room, the comfort room, elevator, staircase, gathering corner, cafeteria, gymnasium, parking bay etc. This is the place where patients use to come, resting and having a social meeting.

As time spent are usually lengthy, it is recognized to be the most suitable venue to place the educational material or media on various theme. Thorough examination of the educational needs must be done before introducing the best media, the best content to fill up the places. Through little bits of creativity, the whole hospital complex can also be comprehensively reoriented and improved to be the credible educational media or hub (Botney M, 2006). The gates, roof, floor, the inside streets, the ambulances, the buses, the wall, the garden, the street light and other settings, all can easily be transformed to transmitted certain educational health messages.

CONCLUSION

The success of medical treatment is a mutual efforts of both medical team and the patient. To patients, it is about their willingness to cooperate with the medical advices, and to medical team, it is about their skills of convincing patients to adhere and comply to the medical advices. In patient education, it is not about selecting the best educational method, it is about identifying the best existing opportunity to communicate the content or the healing message of any education.

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CALL for Teaching English Children's Literature: Hot Potatoes Framework in Taiwanese EFL Classrooms

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Abstract

This study explores some CALL programs using Hot Potatoes framework to respond to the text as an unfolding process and to familiar with the everyday routinized utterances in unabridged English literary works in the context of Taiwan. Lexis competence is an important aspect of English language learning in assisting the conversation flow. The emphasis is on the use of online collaborative activities and CALL programs based on the unabridged novel to enhance students reading skills and vocabulary size in an online learning environment. The potential disadvantages of relying too heavily on the use of electronic media was long ago indicated by the 'United Kingdom Electronic University' (Times High Education Supplement February 2005 THES), in which online technology was emphasized rather than the methodology. It suggests that teaching on the web alone cannot fulfill the purpose of education. This paper aims at justifying the use of technology in creating teachers' own material using CALL programs. The need and theories behind using online teaching activities, two types of Collaborative On-line Learning activities, namely sound Clips on the Web and Hot Potatoes online exercises are introduced. Feedbacks of students on the activities and their learning are discussed. The pros and cons of the Hot Potatoes Tool in reading concordance lines are also stated.

Introduction

The potential disadvantages of relying too heavily on the use of electronic media was long ago indicated by the 'United Kingdom Electronic University' (Times High Education Supplement February 2005 THES), in which online technology was emphasized rather than the methodology. It suggests that teaching on the web alone cannot fulfill the purpose of education. Nevertheless, Lee (2009, pp. 157-162) in his study finds that learners are more willing to ask questions during the learning process in an online learning environment. Carter (1997, p. 161) also emphasizes that "Process-based approaches are learner-centred and seek to encourage students to respond to the text not exclusively as a complete artifact or finished product but rather more to the text as an unfolding process in which the relationship between form and meaning is shown to be central." In view of Lewis' slogan, "Words carry more meaning than grammar" (Lewis, 1993, p.38), the Author makes good use of the online pedagogical approach to help students communicative effectively in a second language.

Within such an approach, teacher and learner factors play an important role because in Taiwan, the teacher is the one who decides how the lesson is structured and what materials and activities are used. Some CALL activities are designed to teach an English children's book using Hot Potatoes framework. This paper

describes the elements incorporated in the Collaborative Online Learning approach, which will be elaborated later.

It is argued that the software or material designers are often not teachers and thus it leads to the need of English teachers creating their own teaching materials for their own collaborative learning purposes. The Author puts forward the idea of integrating English children's literature in her teaching, using data from Arthur Ransome's (1930) *Swallows and Amazons* as source materials. The linguistic justification for choosing *Swallows and Amazons* over any other potentially more suitable text was made by applying five CALL programs based on the corpus of Arthur Ransome's children's books to the EFL learners in Taiwan and found the result desirable (Johns, Lee & Wang, 2008, pp 503-504).

The Collaborative On-line Learning (COL) Approach

Changing views on language learning in the 1970s and 1980s resulted in the emergence of CLT 'Communicative Language Teaching' (Widdowson 1978). It is opposed to the traditional approaches of the 1950s and 1960s, which regarded language as 'a system of rule-governed structures hierarchically arranged' and language learning as 'habit formation' (Nunan and Lamb, 1996:14), CLT defines language as 'a system for the expression of meaning' (Richards and Rodgers, 1986:71) to emphasize interaction and communication. Various approaches such as, 'Data-Driven Learning (DDL)' (Johns, 1991b; Johns & King, 1991; Johns et al. 2008; Lee, 2011), 'Collaborative on-line learning (COL)' (Dillenbourg 1999) can be regarded as variations on the CLT approach (see discussion later).

The three approaches of CLT, DDL and COL have similar implications for the roles of learners, teachers and materials. Learners are no longer considered 'passive recipients of interpretations generated by a teacher or assimilated from books of literary criticism' (Carter & McCarthy 1995: 304) but active participants who explore and discover knowledge of language by themselves, and whose perceptions, including both cognitive and affective responses to the materials taught, can provide valuable feedback to material developers. Teachers, on the other hand, take on the role of *communication facilitators* (resources) instead of stuffing students with information. With the changed role of students as "language detectives" (Johns 1991), this, in effect, has led to a learner-centred approach in language teaching. A great deal of research focuses on re-examining and re-defining the process of teaching and learning from a learner-centred point of view (Stevick 1976; Nunan 1988; Tudor 1996). A learner-centred approach promotes the idea of helping learners "deepen their understanding of language learning, and to acquire the knowledge and skills they need in order to pursue their learning goals in an informed and self-directive manner" (Tudor 1996:37). A learner-centered approach can also activate students' creative thinking and therefore helps them solve problems creatively.

Inspired also by Widdowson (1985, p.186) well-stated comment: "a pedagogy should be developed to guide learners towards an independent ability to read literature for themselves, as a precondition for subsequent study; a capacity for the understanding and appreciation of literature should be developed as a mode of meaning, rather than the accumulation of information and ideas about particular literary works," the Author proposes the idea of integrating the COL approach with the teaching of English children's literature. The COL stresses constructivism-in-context as general theory in making teaching materials. She emphasizes experience-based and learner-centred learning, which involves the strategy of reconstructing meaning and real-world problem solving. The COL suggests that the teacher's role be a facilitator or resource. Based on the idea of learner-centred approach, the COL approach emphasizes not only the role of teacher as resource but a traditional role of an instructor.

Stevick (1976) emphasizes that language learning methods should take account of the attitudes of both learners and teachers toward language teaching, so as to achieve the goal of effective learning. He establishes his ideal of the success of language learning not by 'methods' but by the instructor and learners' personal factors and learning strategies.

Theory behind using Online Teaching Activities: Collaborative On-line Learning (COL) in Teaching English Children's Literature

A situation is collaborative if students are at the same level, perform the same activities, have a common goal and interact in a collaborative way (Lee, 2009, p. 87). Yeh (2007, p.830), proposing a synchronous scaffolding environment on collaborative technical writing, states that "collaborative learning helps students use their own prerequisite knowledge to go beyond what they currently think." Constructivism plays an important part in collaborative on-line learning (Florea 1999:161-164). Vygotsky (1978) proposed that collaborative language learning puts up the principles of social constructivism. It is to meet the requirements of an efficient and motivating learning process. Therefore, "[t]he goal is active exploration, construction, and active learning rather than the passive attendance at lectures or textbook reading" (Norman & Spohrer 1996, pp. 24-27). Dillenbourg (1999, pp.1-12) uses Roschelle's & Teasley's (1995, p. 70) definition of collaboration: "a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem". He characterizes collaborative learning in terms of four criteria – "situations, interactions, processes and effects". On-line teaching activities introduced in this paper integrate also the demonstrations of visualization and sound (e.g., the Canadian teacher's tape recording on the web (http://ms.ntcb.edu.tw/~hsingchin/) under the activity category of *Story*), creative problem-solving (JCross), process-observing (for example, JMix), and assessment of acquired knowledge (e.g., JMatch; JCloze; JQuiz) during the learning process (under the activity category of *Exercises*).

The language in the *Swallows and Amazons* (Ransome, 1930), though used in the 1930s, is well-structured and adaptable, which suits her students' language level and their imaginative development. Most of the language used in the book is English spoken in everyday life. It is also culturally relevant to Taiwanese students as Taiwan is an island yet many Taiwanese young people do not have the opportunities to play with water. The book serves as a good source for students to use their imagination of going adventures and exploring island life. Although the language is from the 1930s, much of it is still serviceable. The activities in this paper are classified in terms of learning through the analysis of the story, the lexical and grammatical realization, making predictions and summary writing and describing the process of doing things. The Author intends to encourage "digital natives" (Prensky 2001), create authentic conditions for language learning and heat up classroom discussion.

Two types of COL Activities

Review and preview, discussion of the content of the text, linguistic realization and the use of Chinese translation

are used in Traditional teaching strategies in Taiwan EFL classrooms. The teaching materials were designed for putting emphasis on reading skills (finding content clues, the characters, the process of doing things, etc) and in relation to other aspects of language learning (listening, speaking, and writing). Within this framework, activities were used in the teaching to:

(1) provide an extended introduction to the literature materials through the online reading of the story, summarizing and making predictions,
(2) help lexical and grammatical realization through (a) lexical focus, such as the study of verbs and the effect of collocation on meaning, and
(3) to help them with the use of translation and English-Chinese parallel texts to solve problems in understanding the texts they read through online exercises.

Sound Clips on the Web

The Author created a website: http://ms.ntcb.edu.tw/~hsingchin/ for online exercises, including listening to the story, identification of glossary and 5 types of online exercises developed using the Hot Potatoes framework. The material for listening to the story includes 31 unabridged chapters, each containing a number of sound clips (click on the story icon on the screen shot of the website). There are four features in the presentation of the online sound clips (see Fig. 1):

Fig. 1 Screen shot of the sound clips

(1) the presentation of English texts with icons to identify the sound clips within the text in every paragraph,
(2) the presentation of both English and Chinese texts on the same screen,
(3) the display of the chapter number of 31 chapters and
(4) the presentation of highlighted phrases or difficulty words both on English and Chinese texts to be matched.

The clips were normally one paragraph in length. Having selected a particular chapter from the list at the foot of the screen, the students clicked on the screen button in the margin of the English text to identify the section to which they wished to listen. Finally students asked for the translation of any word or phrase highlighted in the English text or the Chinese text. The book was presented on screen chapter by chapter with both Chinese and English parallel texts (see Fig. 1), so the students could not read the text of the following chapter which was used as the basis for the prediction exercise. In the unabridged text presented on screen as a preview, certain words (e.g., *a wild surmise*, *hedge* in Fig. 1) were highlighted (bold-font and underlined in the example in Fig.1).

Hot Potatoes Online Exercises

The Hot Potatoes suite is an authoring tool created by the Research and Development team at the University of Victoria Humanities Computing and Media Centre for the purpose of producing web pages for graduate language learning (Arneil and Holmes 1999, p.12), and is marketed by Half-Baked Software. Within the "Hot Potatoes" suite of software are six separate programs, namely JBC (multiple choice answer quizzes), JMix (Reordering Exercises), JQuiz (Quiz Exercises), JCross (Crossword Exercises), JMatch (Matching Exercise) and JCloze (Cloze Exercises) with a shared interface for producing a number of different exercises in a web-page format. The online Hot Potatoes exercises including Put in Order, Crossword, Cloze, Quiz, and Match are designed using the framework of Hot Potatoes Software for students to practice asynchronously. In the synchronous mode, collaborative learning is achieved either between the student and the tutor or the students themselves, whereas in the asynchronous mode, the students do the online exercises in pairs and follow their own pace without having to take account of the progress made by other pairs. The relationship between the integration of online exercises and the teaching of *Swallows and Amazons* is described below:

The Online crossword was designed to teach vocabulary in 'Swallows and Amazons'.
The Online match was designed to help students match the dialogue and the characters.
The Online Mix was designed to help students notice the process of doing things.
The Online quizzes were designed to help students' reading comprehension.
The Cloze was designed for guided summary.

Five screenshots (JMatch, JMix, JCrossword, JCloze and JQuiz) from the Hot Potatoes exercises in the Author's teaching website (http://ms.ntcb.edu.tw/~hsingchin/) are presented as follow:

Fig. 2 Interface of Hot Potatoes Exercises

JMix (Put in order)

The dialogues between the characters on describing the process of doing things are also good resources for creating the exercises. They are based on the events in each chapter to help students internalize their knowledge of English.

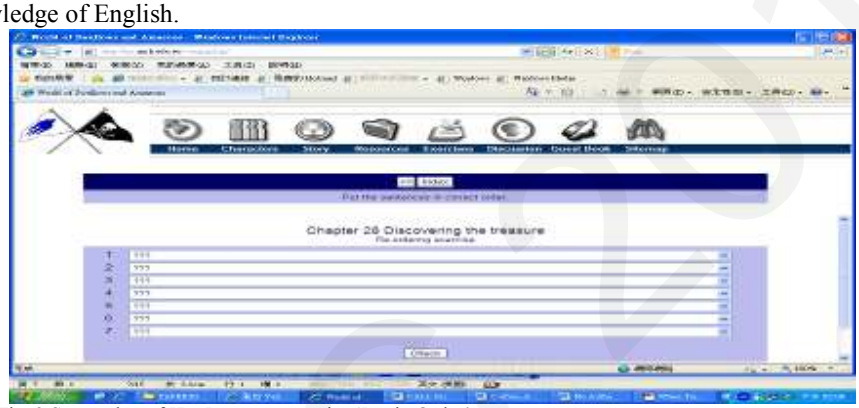

Fig. 3 Screenshot of Hot Potatoes exercise 'Put in Order'

JMatch

The Author used Hot Potatoes framework (JMatch) to create online Matching exercises. An exercise of remembering who says what also tests students' comprehension of the development of the story.

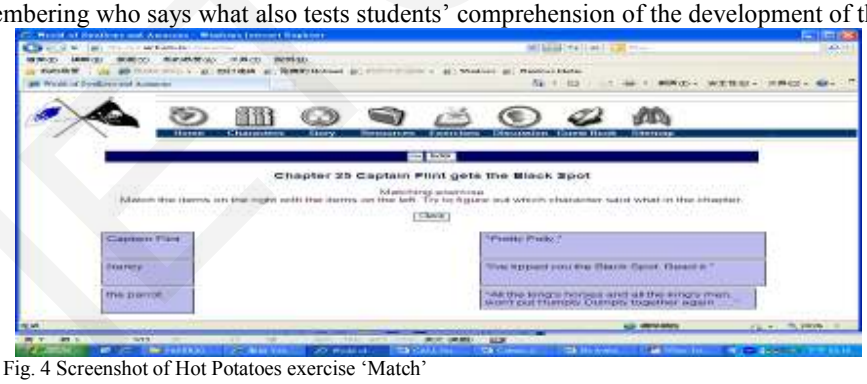

Fig. 4 Screenshot of Hot Potatoes exercise 'Match'

JCloze

The Author created gap-filling exercises. The great limitation of the Hot Potatoes Cloze is that it does not provide 'logging', which may serve as a very important pedagogical purpose for the teacher to analyze students' mistakes. CALL programs which keep 'log' are discussed in Johns, et al. (2008, p.489).

Fig. 5 A Screenshot of Hot Potatoes exercise 'Cloze'

JCross

The Hot Potatoes framework for JCross allows the Author to create crossword puzzles by making good use of vocabulary or language of immediate interest.

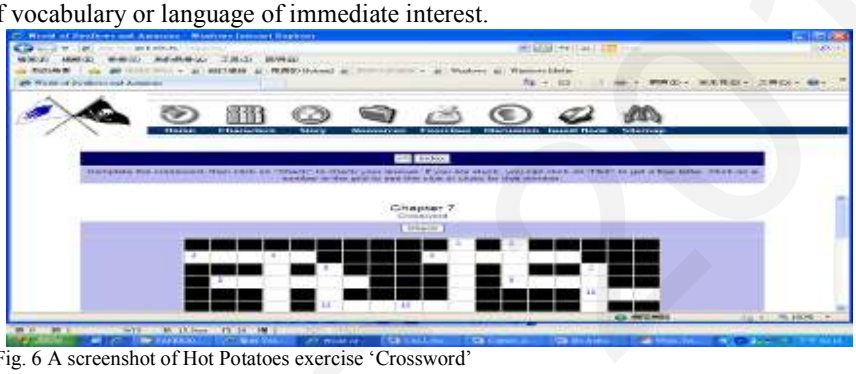

Fig. 6 A screenshot of Hot Potatoes exercise 'Crossword'

JQuiz

Four possible correct answers are provided in each exercise. In other words, teachers who wish to create their online exercises do not need to have any expertise of programming.

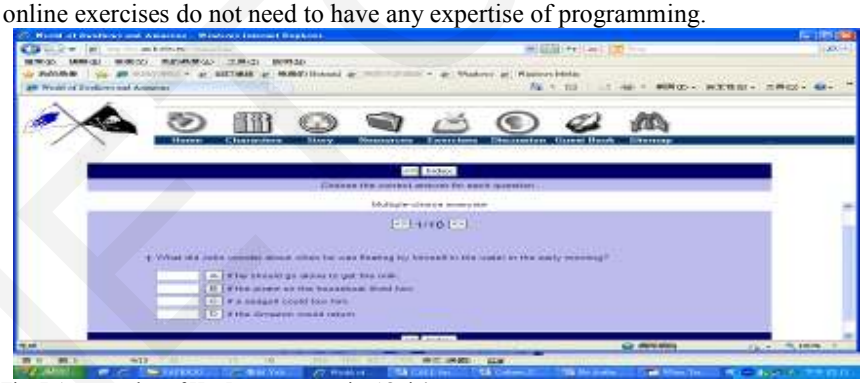

Fig. 7 A screenshot of Hot Potatoes exercise 'Quiz'

Pros and Cons of the Hot Potatoes Tool

In respects of being effective in an online environment, "Hot Potatoes" has its advantages. The most beneficial advantage of Hot Potatoes is to make online exercises possible. Warschauer (1996) states that the instant 'right and wrong' answer checking and individual attention have a positive influence on learners' motivation. Despite the fact that the Hot Potatoes exercise has the disadvantage of its one click right/ wrong feedback system, it is by far the most convenient authoring tool available.

Another advantage of the Hot Potatoes is its potential for student-generated materials because of the simplicity of the interface and authoring applications. Hot Potatoes online exercises help students familiarize

with the teaching materials in self-access time because it ensures that students' cognitive processes are engaged in doing the exercises. Winke & MacGregor (2001) emphasize the positive interactions between the online exercises and the learners. Yeh (2002) also encourages students to use JCloze, JCross and JMatch to design exercises in creating an English learning website.

Yet, there are drawbacks in using the program. For example, unlike the CALL programmes described in Johns, et al. (2008), there is no 'logging' system for analysing the process of students' doing the exercise. Take JMix (Put in order) exercise for example: if the program generates a log file, it will give the teachers an overview of students' performance.

After trying the online exercises, the Author found that the students did increase their English in reading the book. These CALL exercises do draw students' interest. They also serve the purpose of another kind of 'drilling' with meaningful, organized and customized context for students to feel safe and think they are doing what they are used to be doing. How effective the Hot Potatoes exercises are to improve students' English grades needs to be further studied.

Evaluation and Findings

An evaluation was carried out at the end of this study with the 19 aspiring EFL students. The results of the evaluation indicate that after reading at least 15 chapters of a continuous novel, students felt sense of achievement simply because they were capable of reading a long continuous novel. The teaching of vocabulary and grammar had long stood the test of EFL teaching and is proved to have a positive effect on reading comprehension. However, reading comprehension requires not only that knowledge but also reading skills. In case of teaching reading, top-down skills are more effective than the bottom-up skills because the top-down approach helps students to abandon the habit of consulting the dictionary.

The evaluation procedure revealed approval of the CALL activities, with mean scores on a 5 point Likert scale ranging from 4.81 to 4.38. The overall impact of using the CALL exercises is indicated by the fact that the students were extremely *keen to recommend the activities to a friend* (Item 8 Mean 4.81). This might be because the online exercises are different from traditional drills and students felt less stress and much playful when working on them.

In terms of the students' feedback on learning, the survey suggests that the students *enjoyed the course* (Item 1 Mean 4.69), *got practice reading English* (Item 2, Mean 4.63), found *online Hot Potatoes exercise interesting* (Item 3, Mean 4.69) and *liked working with friends* (Item 4 Mean 4.5). Indeed, most students classified *doing Hot Potatoes exercises* as *effective* (Item 5 Mean 4.5), and *the range of activities being motivating* (Item 6 Mean 4.44). Taking the wider view the participants therefore *reported experiencing a feeling of success* (Item 7 Mean 4.44). These results provide considerable scope for satisfaction considering the fact that most of the students are shy, rather inhibited side prone to oral anxiety – as is often the case in Confucian Heritage Countries (CHC) where language teaching tends to be traditional.

Conclusion

This paper discussed the design of a number of activities for language learning. The activities are classified in terms of learning through the reading of the story, the lexical and grammatical realization, making predictions and summary writing and describing the process of doing things. The CDDL methodology is used to design materials for teaching literature in EFL classrooms in Taiwan. It is hoped that the teaching activities applied in this study can help EFL teachers look at the positive side of making their own teaching materials by integrating CALL activities with English children's literature in EFL teaching. The study of lexis through English literature is inseparable from the learning of a foreign language. If employed effectively, the application of the children's literature in EFL classrooms will have great pedagogical value. It can develop learner autonomy, create authentic conditions for language learning and heat up classroom discussion. It is hoped that these materials can motivate students as well as teachers in reading extended texts.

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Can assistive technology help improve early literacy skills of young children with disabilities?

Abstract: Though the use of Assistive Technology is strongly recommended in teaching preschool children with disabilities. However its implementation is early childhood settings is still limited. Factors such as lack of teachers' training programs and sufficient funding to provide such technologies in the classroom are hindering its use. This article seeks to make the case for using assistive technology with young children with disabilities. It provides a discussion of its benefits and gives suggestions for a better implementation.

Introduction

Life in the 21st century is impeding the use of technology in all the aspects of life which forces young children to start using literacy skills in an earlier age. Parette, Hourcade, Boechmann and Blum (2008) states that the availability of computers and technologies offers a great potential for the enhancement of early literacy skills in young children by providing them with contemporary learning styles. However, although the use of AT in the classroom is widely recognized and encouraged with school children, it is rarely investigated in pre-school children. Floyd, Canter, Jeffs and Judge (2008) states that during their attempt to locate studies that investigated the use of AT with pre-school children, they found that throughout the last eleven years there were only eleven studies. This study is seeking to shed a light on the importance of using AT with pre-school children with disabilities.

The Study

Early childhood intervention is defined as attempts by government agencies or other organizations to improve child health and development, educational attainment, and economic well-being (Karoly, Greenwood & Rydell, 1998). The UNICEF Priorities for Children 2002-2005 support providing early childhood intervention programs for children with disabilities (UNICEF Website, 2010). NICHCY, National Dissemination Centre for Children with Disabilities, describes early intervention services as specialized health, educational, and therapeutic services designed to meet the needs of infants and toddlers, from birth through age two, who have a developmental delay or disability, and their families. At the discretion of each State, services can also be provided to children who are considered to be at-risk of developing substantial delays if services are not provided. Whereas, services for preschool children is called "special education preschool services" (http://www.nichcy.org, 2010).

Early identification of disabilities has been recognized by many studies as playing a key role in helping children achieve future success. Federally mandated special education services for pre-schoolers with disabilities calls for the application of appropriate assessments and providing required services to children at risk.

Many researchers have agreed on the importance of early intervention programs. A child's early learning provides the foundation for later learning, thus the sooner a special program of intervention is begun, the further the child is likely to go in learning more complex skills (Bricker & Bailey, 1986). A report by the National Joint Committee on Learning Disabilities [NJCLD] (2006) states that the purpose of early identification is to determine which children have developmental problems which may be obstacles to learning or that place children at risk. Peltzman (1992) states that early identification and intervention provide a foundation for later learning and could thereby foster later academic success.

Many previous studies have shown strong links between early literacy skills acquisition and children's reading and writing abilities throughout the elementary years (Beard, 2003; Whitehurst & Lonigan, 1998). Increasing evidence shows that the quality of early childhood programs can determine

children's social, language, and cognitive progress and school readiness skills (Coleman, Buysse & Neitzel, 2006). Few studies have measured the impacts of early learning on high school graduation, but those with the largest samples reported statistically significant positive impacts (Barnett & Boocock, 1998). Competence in pre-academic and academic skills is a key outcome that affects many areas of a child's life. Children who have strong pre-academic skills in early childhood are more likely to succeed in academic skills once they enter school. Catts (1996) suggests that literacy and pre-academics can be taught to pre-schoolers if presented in a "developmentally appropriate" way.

Though most studies agreed theoretically on the importance of early intervention in helping young children overcome future failure, they did not agree on the nature of the intervention and its length and intensity. Lowenthal (1998) suggested providing developmentally delayed children with the required early intervention which is aimed at improving their pre-academic skills which are the prerequisites of school readiness skills. However in many cases children's individual needs are left unidentified till they start failing. Karoly, Kilburn and Cannon (2005) states that as disadvantaged children do not progress at the same rate as other children, the gap between them widens by times. A study by Abbott-Shim, Lambert and McCarthy (2003) found that children attending early education programs Head Start have sustainable benefits in the areas of receptive vocabulary and phonemic awareness and had more positive health related outcomes. Catts, Fey, Zhang and Tomblin (2001) and Snowling, Gallagher and Frith (2003) report that letter knowledge, phonological awareness, short-term memory, rapid serial naming speed, pesudoword repetition, and expressive vocabulary are the best predictors of later reading performance.

It is known that young children learn better through interactive teaching, rather than traditional, lecture-type teaching (Willis, 1993). Children could benefit greatly from high-quality preschool programs that target literacy skills development and conceptual knowledge (Neuman & Dickinson, 2006). Floyd, Canter, Jeffs and Judge (2008) highlights that due to the mounting emphasis on early literacy skills, early childhood educators should give high consideration to implementing effective, early literacy instruction into the curriculum. Educators should be concerned with developing early intervention programs for preschool children who are experiencing developmental delays. Such programs should be concerned with enhancing children's developmental abilities using all the required means including assistive technology.

Assistive technology is a type of technology that offers compensatory resolutions to the challenges presented by these children (Judge and Parette, 1998). Assistive technology is defined by IDEA as "any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities. The term does not include a medical device that is surgically implanted, or the replacement of such device (Authority 20 U.S.C. 1401(1)). Parette and Stoner (2008) states that the above mentioned definition concentrates on the compensating nature of AT. In other word, AT is supposed to help children and adults with disabilities to act independently at schools and community. Parette and Peterson-Karlan (2007) assures that AT is not used merely to grant young children access to educational settings but to provide them with equal opportunities to accomplish success in both school and life.

As the result of the mounting emphasis on literacy skills, young learners who have developmental delays or are at risk for school failure could have more effective teaching of basic emergent literacy skills by using AT in the classroom (Parette, Hourcade and Blum, 2011).

Floyd et al. (2008) identifies three types of AT used in the classroom. First no- technology solutions which is using methods and strategies to help children accomplish the required skills. No-technology includes strategies such as additional time, color coding, using cards in matching and using manipulatives. Second low-technology solutions which includes pencil adapters, voice announcers, raised-line paper and step-by-step picture schedules. The third type of technology used in the classroom is high-technology solutions which includes the use of computers, computer software or the use of high technology compensating devices. Parette and Stoner (2008) assures that if AT is effective in helping children develop the required skills for success, then it would be a welcomed addition to early childhood classrooms.

A study by Turbill and Murray (2006) suggests that the implementation of a computer-based software that has figures and presentation which are familiar to the children in the curriculum could have

the potential to enhance children's early literacy skills. Parette, Wojcik, Stoner and Watts (2007) reports that programs such as Microsoft PowerPoint is a useful tool for the development of emergent literacy skills. Parette and Stoner (2008) recognizes three benefits of AT for children with disabilities in the classroom. Firstl the immediate improvement in children's attending behaviour which is a prerequisite for all learning. Second a reduction of problematic behaviour which is noticed by children obedience to classroom rules. Third the development of better expressive and receptive communication skills.

Peterson-Karlan, Hourcade and Parette (2008) assures that incorporating technologies into writing instruction has the potential of improving the writing skills of children with physical and educational disabilities. Caverly (2008) identifies four conditions that would make using AT interventions for writing effective. The first condition is to have access to AT. The second is to have assistance to choose the most suitable technology. The third is to be adequately trained to use this technology. The forth is educating families on how to use and support their children in using the assigned AT.

Though the established benefits of AT in helping young children accomplish future success in developing literacy and independence skills its use in the classroom is still limited. Parette et al. (2011) identifies the cost of providing technology and training teachers to use it as the main obstacles that hinder using AT in the classrooms. A survey by Smith and Kelley (2007) of AT and teacher's preparation programs for individuals with visual impairments showed that teachers lack the needed experience in dealing with AT for visually impaired children.

Conclusions

This paper tried to shed a light on the use of AT in early childhood programs. It concludes that using AT is strongly recommended in classrooms of preschool children with disabilities. Its benefits are well documented in helping young children with disabilities develop early literacy skills which are prerequisites for future success. However such goals are hindered by the lack of sufficient funding to provide such technologies in the classroom and appropriate teacher preparation and training to help them deal with day to day usage of such technologies.

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CAREER GUIDANCE NEEDS OF MECHATRONICS EDUCATION DEPARTMENT GRADUATES

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Abstract
In addition to the fact that university life is a period when students acquire basic knowledge regarding their future professions, students also need guidance and explanations in relation with concerned professions during this period. Informative meetings should be held in the course of university period in order to inform students of places where they can work as well as working conditions, responsibilities, steppingstones, etc. If they aren't informed of these subjects, graduate students encounter certain difficulties after starting a professional activity and they can't develop themselves consciously in their professional lives. In this context, the objective of this study is to determine to what extent students graduated from Mechatronics Department are informed of possible job opportunities during their university education period as well as their need for career guidance. For this reason, researchers prepared a "Career Guidance Questionnaire" in order to determine career guidance needs of graduates and 52 graduates were contacted in total. According to obtained findings, it is understood that most of graduate students need career guidance and that they aren't sufficiently informed of this matter during their university period.

INTRODUCTION

In our day, scientific and technological advancements, social and political shifts, competition bring along important changes in social and economical environments, particularly in organizational structures. Change of organizational structures with the influence of such concepts as globalization, technology, change and information society as well as developments in education and expectations of individuals change also the meaning of career. Although until recently career was used to mean professional advancement, now it is no longer possible to define the career concept only by advancement. In our day, career means a job restructuring process which is meaningful and psychologically satisfying for individuals. In this process, knowledge acquisition and self-development are more important than professional advancement. In our day entitled as the information age, such concepts as lifetime job opportunities, functional titles and continuous advancement increasing the income left their place to the need for lifetime learning, continuous self-development and staying always employable (Osipow; Fitzgerald, 1996).

Career development starts as early as individuals' childhood and becomes serious in secondary education years. After choosing their profession and entering into a university, individuals are occupied with professional advancement opportunities.

According to Ginzberg et al. (1951), career choice is a development process. This process is defined as the irreversible decision process which is made as a result of desires and opportunities of an individual and which develops during the whole life. Roe (1956) puts forth in her career choice theory that the environments in which the childhood is lived and personality traits developed during the childhood have important roles in career choice. And Donald Super (1953) contributed very much to the theory of career choice aimed at development. According to Super, the individuality formed as a result of interaction of individual with its environment during development process influences the career choice of the individual. Career choice is seen as a compromise between the individuality of persons and socioeconomic factors (Brown, 2003: 33). Tiedeman and O'Hara (1963) define the career development as an identity development and claim that the formation of individuality concept continues for the lifetime. (Pilavcı, 2007).

Career concept has been evaluated in different ways since 70s and researches have been carried out on this subject. We see that studies conducted are concentrated rather on such subjects as career movement, career and job stagnation as well as such related subjects as career plateau, career balances and socialization. It will be useful to understand these concepts briefly in order to explain career planning and career methods applied in enterprises. Career movement indicates a person's professional activity in different organizations or in different positions in the same organization in relation with his/her career. Whichever is the case, the main focus of career movement is continuous promotion. Career stagnation

means stagnant periods of individuals during their career life. Stagnation periods are important for individuals in order for them to develop their competences regarding their career, to put their family-professional relations in order and to stock both physical and psychological energy for future works (Diken, 2006).

As it is explained before, career is a development process. Individuals experience different processes in relation with career development during various age periods. These processes are as follows:

1. Pre-employment Period: In this period, individuals receive formal education in relation or in possible relation with their future careers. Security, safety, physiological requirements have priority. This period ends around the age 25. (Can et al.,1995:164). This period is the time when one proves oneself and evaluates alternatives (Aytaç, 1997:63).

2. Employment Period: In this period, persons start to work in a job. This is the beginning of career. Individuals' priorities are security and safety. This stage is completed in a five-year period.

Acquiring new skills and developing attitudes change the motivation of personnel. After feeling that they have skills in the field that they have chosen, individuals are sure of themselves for searching new job opportunities and working fields. This is a period when new conflicts are formed between the way their time is spend in the workplace because of increasing competition and their increasing responsibilities toward their families. (Uygur, 1998:129).

3. Career Developing Process: This process can be defined as the career path to be taken after obtaining a certain level of experience and knowledge. In this phase, employees may face a career dilemma and enter in a process of questioning. In this phase, they may take such decisions as changing working field or setting up their own business.

4. Career Protection Process: Individuals enter into a career plateau which is defined in general as stress or boredom. Reactions of individuals entering in this period exhibit responses and variations. During this period, certain physical and logical processes start to slow down naturally (Uygur, 1998:13).

5. Retirement Period: In general, retirement happens between ages 55 and 65. With the arrival of retirement, people complete their careers. Some people plan their retirement while some others stay within the organization and want to present their experience acquired until then to the service of organization and do consultancy (Aytaç, 1997:70-71).

It is clear that guidance services aimed at informing students of career opportunities are important during their university education period. In our country, guidance activities are rather concentrated on primary and secondary education levels but they are also quite important at university level. Guidance definitions vary depending on applied education levels.

Brown defines the guidance as one of many branches of human resources development and describes it as "a process where an experienced individual helps or guides another person who is inexperienced in the field" (Appelbaum, 1994).

Studies have shown that guidance is as popular for employees as it is strategically important for organizations (Gibb, 1994: 33). If an organization applies guidance, it means that this organization pays attention to its employees and the success of the organization is based on the loyalty and skills of the whole labor force.

METHODOLOGY

In this research, career guidance needs of individuals graduated from Mechatronics Education Department are investigated within the framework of prepared questionnaire. Since this research demonstrates a situation as it is, it is a scanning model research (Karasar, 2006). Study group of the research consists of 51 individuals graduated from Mechatronics Education Department of Marmara University, Technical Education Faculty.

In order to obtain data, "Personal Information Questionnaire" and "Career Guidance Questionnaire" were prepared by researchers. The said personal information questionnaire consists of 6 questions prepared in order to obtain personal information of students (sector of activity, whether the realized activity is related to the department from which they are graduated, satisfaction level of expectations regarding the department from which they are graduated and realized activity, satisfactory level of economical conditions of their professional activity, their position at working place and to what extent they were informed of job opportunities while they were students in university).

"Career Guidance Need" questionnaire is also prepared by researchers and results were evaluated by an expert in order to insure validity and reliability. A draft version was prepared firstly for the questionnaire and it was shown to expert professors. According to their recommendations, final version of the questionnaire was formed. "Career Guidance Need" questionnaire consists of 20 statements. These statements were prepared in order to investigate "to what extent" graduates of Mechatronics Department

were informed of career opportunities while they were students in the university. Application data was analyzed with SPSS statistics software. Frequencies and percentage values with regard to data analysis were given within tables.

FINDINGS

1. Findings Regarding Personal Information of Mechatronics Education Department Graduates

Table 1. Findings regarding responses of research participants to "Your Sector of Professional Activity" question

	Frequency (F)	Percentage (%)
Jobseeker and unemployed	30	58,8
Quality Systems	1	2
Automation	7	13,7
Machinery and construction fittings	2	3,9
Mechatronics	3	5,9
Education & Consultancy	2	3,9
Master's Degree	1	2
Technical proofreading-documentation	1	2
Robotics	1	2
Production-Manufacturing	1	2
Software	1	2
Electronic instruments trade	1	2
Total	51	100

When we examine the findings regarding the question "Your Sector of Professional Activity", we can see that 30 (58,8%) of research participants seek job or they are unemployed, that 1 (2%) of them works in quality systems, 7 (13,7%) of them in automation, 2 (3,9%) of them in machinery and construction fittings, 3 (5,9%) of them in Mechatronics, 2 (3,9%) of them in education & consultancy, 1 (2%) of them in master's degree, 1 (2%) of them in technical proofreading-documentation, 1 (2%) of them in robotics, 1 (2%) of them in production-manufacturing, 1 (2%) of them in software, 1 (2%) of them in electronic instruments trade fields. Accordingly, majority of research participants consists of "students, jobseekers and unemployed persons". Other than this majority, most of remaining persons works in "automation" sector.

Table 2. Findings regarding their responses to "Were You Informed of Job Opportunities While You Were Student in the University?" question

	Frequency (F)	Percentage (%)
Yes	13	25,5
Partly	23	45,1
No	15	29,4
Total	51	100

When we examine the findings regarding the question "Were You Informed of Job Opportunities While You Were Student in the University?", we can see that 13 (25,5%) of research participants select yes choice, 23 (45,1%) of them select partly choice, 15 (29,4%) of them select no choice. Accordingly, majority of research participants were informed of job opportunities while they were student in university as "Partly".

2. Findings Regarding the Questionnaire Prepared in order to "Determine Career Guidance Needs" of Mechatronics Education Department Graduates

Table 3. Findings regarding their responses to "I Was Informed of My Legal Rights Regarding My Field of Activity" statement

	Frequency (F)	Percentage (%)
Yes	6	11,8
Partly	9	17,6
No	36	70,6
Total	51	100

Table 4. Findings regarding their responses to "I Was Informed of Job Interview Techniques and How to Act in a Job Interview" statement

	Frequency (F)	Percentage (%)
Yes	3	5,9
Partly	9	17,6
No	39	76,5
Total	51	100

When we examine the findings regarding the question "I Was Informed of My Legal Rights Regarding My Field of Activity", we can see that 6 (11,8%) of research participants select yes choice, 9 (17,6%) of them select partly choice, 36 (70,6%) of them select no choice. Accordingly, majority of research participants weren't informed their legal rights regarding their field of activity.

When we examine the findings regarding the question "I Was Informed of Job Interview Techniques and How to Act in a Job Interview", we can see that 3 (5,9%) of research participants select yes choice, 9 (17,6%) of them select partly choice, 36 (70,6%) of them select no choice. Accordingly, majority of research participants weren't informed of job interview techniques and how to act in a job interview.

Table 5. Findings regarding their responses to "While I Was Receiving My Education, I Was Informed of How to Plan My Career after Starting to Work in a Workplace" statement

	Frequency (F)	Percentage (%)
Yes	2	3,9
Partly	12	23,5
No	37	72,5
Total	51	100

Table 6. Findings regarding their responses to "I Was Informed of Resources Which Will Help Me Follow Innovations in Relation with My Field" statement

	Frequency (F)	Percentage (%)
Yes	5	9,8
Partly	26	51
No	20	39,2
Total	51	100

When we examine the findings regarding the question "While I Was Receiving My Education, I Was Informed of How to Plan My Career after Starting to Work in a Workplace", we can see that 2 (3,9%) of research participants select yes choice, 12 (23,5%) of them select partly choice, 37 (72,5%) of them select no choice. Accordingly, majority of research participants weren't informed of how to plan their career after starting to work in a workplace while they were receiving their education.

When we examine the findings regarding the question "I Was Informed of Resources Which Will Help Me Follow Innovations in Relation with My Field", we can see that 5 (9,8%) of research participants select yes choice, 26 (51%) of them select partly choice, 20 (39,2%) of them select no choice. Accordingly, majority of research participants were informed of resources which will help them follow in

Table 7. Findings regarding their responses to "There Were Clubs, Establishments and Similar Organizations at University in Relation with My Field of Activity and I Was Oriented" statement

	Frequency (F)	Percentage (%)
Yes	12	23,5
Partly	19	37,3
No	20	39,2
Total	51	100

Table 8. Findings regarding their responses to "Activities Aiming at Developing Professional Creativity Were Organized" statement

	Frequency (F)	Percentage (%)
Yes	6	11,8
Partly	16	31,4
No	29	56,9
Total	51	100

When we examine the findings regarding the question "There Were Clubs, Establishments and Similar Organizations at University in Relation with My Field of Activity and I Was Oriented", we can see that 12 (23,5%) of research participants select yes choice, 19 (37,3%) of them select partly choice, 20 (39,2%) of them select no choice. Accordingly, majority of research participants weren't informed of clubs, establishments and similar organizations at university in relation with their field of activity.

When we examine the findings regarding the question "Activities Aiming at Developing Professional Creativity Were Organized", we can see that 6 (11,8%) of research participants select yes choice, 16 (31,4%) of them select partly choice, 29 (56,9%) of them select no choice. Accordingly, majority of research participants weren't organized activities aiming at developing professional creativity.

Table 9. Findings regarding their responses to "I Received Trainings with the Aim of Developing Communication Skills" statement

	Frequency (F)	Percentage (%)
Yes	2	3,9
Partly	15	29,4
No	34	66,7
Total	51	100

Table 10. Findings regarding their responses to "I Was Informed of Ethical/Legal Characteristics of My Field of Activity" statement

	Frequency (F)	Percentage (%)
Yes	1	2
Partly	15	29,4
No	35	68,6
Total	51	100

When we examine the findings regarding the question "I Received Trainings with the Aim of Developing Communication Skills", we can see that 2 (3,9%) of research participants select yes choice, 15 (29,4%) of them select partly choice, 34 (66,7%) of them select no choice. Accordingly, majority of research participants didn't provided trainings with the aim of developing communication skills.

When we examine the findings regarding the question "I Was Informed of Ethical/Legal Characteristics of My Field of Activity", we can see that 1 (2%) of research participants select yes choice, 15 (29,4%) of

them select partly choice, 35 (68,6%) of them select no choice. Accordingly, majority of research participants didn't informed of ethical/legal characteristics of their field of activity.

Table 11. Findings regarding their responses to "I Received Trainings in order for me to Develop My Teamwork Skills" statement

	Frequency (F)	Percentage (%)
Yes	16	31,4
Partly	14	27,5
No	21	41,2
Total	51	100

Table 12. Findings regarding their responses to "I Was Informed of Such Subjects as Prestige of My Profession, Its Economical Return, Working Conditions, etc." statement

	Frequency (F)	Percentage (%)
Yes	10	19,6
Partly	34	66,7
No	7	13,7
Total	51	100

When we examine the findings regarding the question "I Received Trainings in order for me to Develop My Teamwork Skills", we can see that 16 (31,4%) of research participants select yes choice, 14 (27,5%) of them select partly choice, 21 (41,2%) of them select no choice. Accordingly, majority of research participants didn't provided trainings in order for them to develop their teamwork skills.
When we examine the findings regarding the question "I Was Informed of Such Subjects as Prestige of My Profession, Its Economical Return, Working Conditions, etc.", we can see that 10 (19,6%) of research participants select yes choice, 34 (66,7%) of them select partly choice, 7 (13,7%) of them select no choice. Accordingly, majority of research participants were informed of such subjects as prestige of their profession, its economical return, working conditions as "partly".

Table 13. Findings regarding their responses to "I Was Informed of Characteristics of Workplaces Carrying Out Their Activities in the Same Field as Mine" statement

	Frequency (F)	Percentage (%)
Yes	5	9,8
Partly	24	47,1
No	22	43,1
Total	50	98

Table 14. Findings regarding their responses to "I Received Trainings in order for me to Develop My Problem Solving Skills" statement

	Frequency (F)	Percentage (%)
Yes	6	11,8
Partly	23	45,1
No	22	43,1
Total	51	100

When we examine the findings regarding the question "I Was Informed of Characteristics of Workplaces Carrying Out Their Activities in the Same Field as Mine", we can see that 5 (9,8%) of research participants select yes choice, 24 (47,1%) of them select partly choice, 22 (43,1%) of them select no choice. Accordingly, majority of research participants were informed of characteristics of workplaces carrying out their activities in the same field as theirs as "partly".
When we examine the findings regarding the question "I Received Trainings in order for me to Develop My Problem Solving Skills", we can see that 6 (11,8%) of research participants select yes choice, 23 (45,1%) of them select partly choice, 22 (43,1%) of them select no choice. Accordingly, majority of research participants were provided trainings in order for them to develop their problem solving skills as "partly".

Table 15. Findings regarding their responses to "I Received Trainings in order to me to Develop My Entrepreneurship Skills" statement

	Frequency (F)	Percentage (%)
Yes	4	7,8
Partly	15	29,4
No	32	62,7
Total	51	100

Table 16. Findings regarding their responses to "I Was Informed of Job Opportunities Abroad in relation with My Field of Activity" statement

	Frequency (F)	Percentage (%)
Yes	6	11,8
Partly	16	31,4
No	29	56,9
Total	51	100

When we examine the findings regarding the question "I Received Trainings in order to me to Develop My Entrepreneurship Skills", we can see that 4 (7,8%) of research participants select yes choice, 15 (29,4%) of them select partly choice, 32 (62,7%) of them select no choice. Accordingly, majority of research participants weren't provided trainings in order to them to develop their entrepreneurship skills.
When we examine the findings regarding the question "I Was Informed of Job Opportunities Abroad in relation with My Field of Activity", we can see that 6 (11,8%) of research participants select yes choice, 16 (31,4%) of them select partly choice, 29 (56,9%) of them select no choice. Accordingly, majority of research participants weren't informed of job opportunities abroad in relation with their field of activity.

Table 17. Findings regarding their responses to "I Was Informed in Detail of Sectors related or Close to My Profession" statement

	Frequency (F)	Percentage (%)
Yes	5	9,8
Partly	18	35,3
No	28	54,9
Total	51	100

Table 18. Findings regarding their responses to "I Received Trainings in order for me to Develop My Risk Taking Skills" statement

	Frequency (F)	Percentage (%)
Yes	2	3,9
Partly	7	13,7
No	42	82,4
Total	51	100

When we examine the findings regarding the question "I Was Informed in Detail of Sectors related or Close to My Profession", we can see that 5 (9,8%) of research participants select yes choice, 18 (35,3%) of them select partly choice, 28 (54,9%) of them select no choice. Accordingly, majority of research participants weren't informed in detail of sectors related or close to their profession.
When we examine the findings regarding the question "I Received Trainings in order for me to Develop My Risk Taking Skills", we can see that 2 (3,9%) of research participants select yes choice, 7 (13,7%) of them select partly choice, 42 (82,4%) of them select no choice. Accordingly, majority of research participants weren't provided trainings in order for me to develop their risk taking skills

Table 19. Findings regarding their responses to "I Was Informed of Such General Guidance Subjects as Self-Confidence, Motivation Increase, Stress Management, etc." statement

	Frequency (F)	Percentage (%)
Yes	2	3,9
Partly	15	29,4
No	34	66,7
Total	51	100

Table 20. Findings regarding their responses to "While I Was Studying, I Received Trainings In Relation With Conflict Resolution in Workplace" statement

	Frequency (F)	Percentage (%)
Yes	3	5,9
Partly	5	9,8
No	43	84,3
Total	51	100

When we examine the findings regarding the question "I Was Informed of Such General Guidance Subjects as Self-Confidence, Motivation Increase, Stress Management, etc.", we can see that 2 (3,9%) of research participants select yes choice, 15 (29,4%) of them select partly choice, 34 (66,7%) of them select no choice. Accordingly, majority of research participants weren't informed of such general guidance subjects as self-confidence, motivation increase, stress management, etc.
When we examine the findings regarding the question "While I Was Studying, I Received Trainings In Relation With Conflict Resolution in Workplace", we can see that 3 (5,9%) of research participants select yes choice, 5 (9,8%) of them select partly choice, 43 (84,3%) of them select no choice. Accordingly, majority of research participants weren't provided trainings in relation with conflict resolution in workplace while they were studying.

RESULT AND RECOMMENDATIONS

In the light of obtained data, it can be seen that Graduates of Mechatronics Department didn't get in general healthy career guidance. Given the fact that graduates responded almost all statements negatively, this finding is clear.
Under the framework of obtained findings, it can be seen that students need to be informed and oriented regarding their professions while they receive university education. In this context, we think that it is important to found certain establishments within the body of university for each department in order to carry out such informative activities. Characteristics, steppingstones, working conditions and opportunities of each department are different from each other. For this reason, we think that departments need to plan field-specific and informative guidance activities. Instructors may be appointed in order to realize these activities. It is clear that it is important to plan such activities as sectoral visits, special presentation days with field experts, field-specific career days, etc. and to spread them to the whole university education period in order to respond to career guidance needs.

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CHALLENGES IN TEACHING AND LEARNING SUPPORT IN TRANS-NATIONAL DELIVERY OF UNIVERSITY PROGRAMS

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Abstract: This paper examines the challenges of delivering tertiary education to Asian students from an Australian university campus based in Singapore. A study of fifty students from China, India, Indonesia and Myanmar was carried out in 2010 who were enrolled in undergraduate and postgraduate programmes. The aims of the research were to investigate the implications of teaching and learning approaches, and to gauge the expectations of both the education provider and international students. The main conclusions were that students, coming from a non-Western background with diverse educational systems, were ambivalent about the different approaches to learning and the difficulties in meeting academic standards, and, their low level command of the English language compounded the problems. From the perspective of the university, academics assume that students have adequate English language proficiency and that they adopt Western learning conventions expeditiously and any problems that arise can be solved by teaching and learning support.

Introduction

Australian universities in Singapore with about twenty thousand students, enjoy the largest proportion of enrolments among other foreign institutions. These twenty Australian higher learning institutes have either tie-ups with local universities and polytechnics or physical campuses. Taking advantage of the English language as the 'lingua franca', of its leadership in education and of neoliberal economic globalization (Pennycook, 1999a, 1999b), Australian universities have seen an exponential growth in transnational (or offshore) higher education. Benefitting from its leadership position, Australian higher education remains attractive to foreign students. This is based on several factors. Firstly, to ensure quality and international standards, the Australian Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS) aims to protect the interests of foreign students, while keeping a close watch on Australian education's international quality and reputation. Second, by establishing the Education Services for Overseas Students (ESOS), Australia has ensured the legal protection of international study, thus guaranteeing high quality service to the student. Third, by offering worldwide recognised qualifications which are part of the Australian Qualifications Framework (AQF), Australian universities offer a seamless transition into higher education for their international students. Instead of relocating to Australia, a considerable number of students prefer to study at one of the Australian off-shore campuses in Singapore for several reasons: overall, Singapore offers lower living costs, proximity to home country and similarities to culture, ease of adaptation and the possibility to graduate one year in advance, thus reducing living and studying expenses. Nonetheless, the transition from a non-Western education is not trouble-free. In this paper, the term transnational student refers to overseas students studying for a degree in an Australian university in Singapore. UNESCO and the Council of Europe (2001), describes 'transnational' higher education as education provided by an institution located offshore (not in country of origin but in a host country) to students coming from different countries. Western or Anglo-Saxon education is used interchangeably and denotes English-speaking education.

Previous research focusing on Asian students studying at Western Anglophone universities (Britain, Australia and the U.S.) has denoted that there are several factors impeding their academic achievement such as, language, culture, educational background, financial pressures and emotional issues (Huang & Klinger, 2006). Also, most past studies have been limited to subject areas and, to either staff or

Chinese students' perspectives. However, the challenges are complex for the provider of language and academic literacies support in a transnational setting, across all programs located in two different campuses to a population of over two thousand three hundred students. Thus, the purpose of this study is to investigate the implications of Western teaching style and non-Western learning approaches, academic staff and students' expectations, and located at the crossroads of these expectations in the context of teaching and learning. This study was undertaken to identify the issues by focusing on specific problems and giving a perspective across the stakeholders in an Australian institute offering higher education in Singapore.

Context

Whether based in Australia or offshore, one of the entry requirements to Australian universities is English language proficiency. Unless a student has a previous degree taught in English, a student wishing to study at an Australian university must have an International English Language Testing (IELTS) score of 6.0 or equivalent for general entry to undergraduate studies and a score of 6.5 for postgraduate studies. This implies that students who have obtained that score have the ability to cope linguistically with their chosen course of study. This erroneous belief leads many transnational students to assume that since they have met the university's entry requirements, they can manage their studies without further help. Those who do not meet the criteria can start their higher education studies after completing a two-semester foundation programme. However, regardless of their previous studies or English language proficiency scores, the majority of foreign students enrolled in Australian degree programs in Singapore require English language and academic skills development and support throughout the course of their studies.

The majority of international students studying in Australian offshore campuses in Singapore are of Confucian Heritage Culture (CHC) a term coined by Biggs (1994) and of Non-English speaking background (NESB). One dominant issue facing these students is English language proficiency. The degree of difficulty is further exacerbated for CHC students of Chinese origin as the cross-linguistic transfer is very low. This is based on the fact that there is no positive transfer, namely, transfer of metalinguistic knowledge between their first language (L1) and second language (L2) which inhibits overall comprehension (Huang, 2004, 2005; Liu, 1994, Zhong, 1996). They use a face saving communicative strategy, and adopt an indirect writing style. Coming from a collectivist culture, CHC NESB students have been exposed to a different educational learning style and differ from Western students who, from an early age, learn to be analytical and voice their views. Students coming from China, Myanmar, India and Indonesia are taught to learn by listening, not arguing or questioning for the sake of harmonious and respectful relationship building. These students' linguistic politeness and face saving strategy reflects their attitude towards creating a non-threatening environment where each individual is acknowledged and respected (Chuah, 2010). This positive face stance fits squarely in Brown and Levinson's (1987) model of politeness. Hence, most will not ask questions or publicly state that they do not understand for fear of losing face and rely heavily on lecturers' instructions (McLoughlin & Oliver, 2000). These students are not ready to learn abstract and complex concepts and the discourse and conventions of the disciplines. The manifestation of interference from native language can be easily observed in students' writing, and an error analysis offers significant insight into the nature of difficulties in writing faced by most students. It is quite clear that they are using discourse patterns embedded in their own language as well as culture, such as repetitiveness occurring in essays. This is a strong characteristic of semitic pattern discourse used for emphasis such as in Arabic and Farsi (Miller, 2007). As for oriental discourse (also known as Asian discourse) the lack of connection between the main idea and details (spiralling and indirect) is one of the major problems in students' English writing (Gudykunst, 2004). Most CHC NESB students are unaware of the fact that they are using a discourse style inappropriate to English academic writing conventions.

Partly due to their inadequate English language skills, students' lack of active participation in class discussion and hesitance in communicating impedes their learning (Huang, 2005). In addition, international students are not given adequate time to adapt to the standards of Western academic culture, expectations and scholarly conduct. In a very short period of time, while lacking sufficient vocabulary to understand key content and concepts, they have to figure out how to synthesize new information, critically analyze and argue. These academic skills are alien to them and generate more lecturer and tutor dependency. For the Asian learner the "teacher is the final authority" (Ladd & Ruby, 1999; Tin, 2008). Chung, Kelliher and Smith (2006) further expand this notion to non-CHC countries such as India and

Indonesia. On the other hand, most academics have pedagogical assumptions in terms of their students' metalinguistic awareness (MA) and knowledge (Bialystok, 2007). Bialystok, Luk and Kwan (2005) offer further evidence that alphabetic writing systems have an impact on the level of cross-linguistic transfer, namely, the transfer between L1 and L2 (Cicero & Royer, 1995; Durgunoglu, Nagy & Hancin–Bhatt, 1993). Academics as non-language experts, have limited understanding of core language issues and expect students to have the ability to present an argument and to provide evidence from literature in support of their own views, thus trapping the students into a 'cut and paste' situation in an attempt to disguise their deficiencies (McGowan, 2005). Another problem is that for the students, altering 'paraphrasing' authorities' words is for the students a sign of disrespect as knowledge should be conserved and transmitted 'ad verbum', hence plagiarism becomes a serious issue. These core Western concepts are completely alien to them and lecturers are ill equipped to deal with students' needs while at the same time keeping academic standards and quality (Ryan & Carrol, 2005).

For most Asian students who leave their homeland to study at an Australian university they rarely raise their hands to ask questions out of respect for their lecturers and for fear of looking ignorant. Furthermore, in Singapore they feel excluded by local student groups and feel more comfortable and confident when they are with students from their own country. These feelings of isolation and frustrations are further exacerbated when lecturers appear to be uncaring and reluctant to guide them every step of the way. They expect teachers to take the role of their parents (Chuah, 2010) and when their needs are not met, they turn to teaching and learning support to take responsibility for their learning and success. However, the lecturers' approach is to foster independent learning which collides deeply with the Asian teaching style that cultivates a nurturing style. It is not surprising then, that Asian international students expect to be told what to do 'exactly' (Huang & Rinaldo, 2009) and appear in their lecturers' eyes as needy of 'spoon-feeding'.

Method

This study aims at investigating the impact of culture, language and educational background of international students in an Australian university's offshore campus based in Singapore. It explicitly explores staff's teaching and students' learning approaches and their expectations. As the main objective is to add richness and depth to this research, semi-structured interviews included discussions related with their experiences in the host country. The study collected data from 50 Asian students enrolled at an Australian University based in Singapore. To add credibility to the study (Gay & Airasian, 2003), a group of fifty international students from China, India, Indonesia, and Myanmar, and of various age groups, gender and study programmes were randomly selected. The voluntary participants were 13 males (26 percent) and 37 females (74 percent) aged from 19 to 22 representing four countries. They were 22 Chinese (44 percent), 9 Indian (18 percent), 17 Indonesian (34 percent), and 2 Burmese (4 percent). Of the 50 students, 10 (20 percent) were postgraduate students and the other 40 (80 percent) were undergraduates. This study draws on the semi-structured, face-to-face interviews and students' reflections conducted at an Australian higher education provider in Singapore between February and November 2010. The results of the study show significant similarities in the negative factors affecting their studies. To ensure anonymity and confidentiality, the institution and individuals have been de-identified. The hand recorded interview data were analysed based on Jonassen and Rohrer-Murphy (1999) activity theory framework. The responses were grouped and analysed according to the issues identified. The first set of questions focused on the participants' education background and the problems adapting to a Western tertiary education. The second set looked at time and financial factors; the third tried to identify the emotional factors and lastly, analysed the implications for teaching and learning support.

Results and Discussions

Following the analysis of the interviews, the most pressing concerns affecting these students were: first, linguistic competence, second, educational background and cognitive factors, third, time constraints and financial factors, and lastly, emotional factors. These factors and academic staff's attitudes and perceptions are further highlighted in the discussions.

Linguistic Competence

There were many common responses concerning English language competence. Except Indian students, 91 percent of the participants indicated their lack of English language proficiency as a

significant factor impeding their studies and progress. A Burmese, student made the following comment: "In my home town, I had English as one subject in high school and never wrote an academic essay in English language before coming here." All Chinese students interviewed indicated their poor vocabulary; this was echoed by the seventeen Indonesian students; "My vocabulary is insufficient to understand content and concepts." Their limited language competence also hindered their active participation during lectures and tutorials. In contrast, the Indian students felt more at ease with their language proficiency and strongly emphasized that their English language skills were adequate for their studies, further indicating "the teachers are not telling us what we are supposed to do. We are all confused and many times we asked the lecturer for help. But, she doesn't give us answers and I could not find them in my textbook. She says we have to do research to find the answers. I don't know what to do." The most frequently reported confusion regarding their English language proficiency is the fact that while getting good grades in one subject, they fail in another based on their language proficiency issues.

Educational Background and Cognitive Factors

Another factor affecting negatively students' tertiary education is based on their inexperience in academic literacy. As one Indonesian student notes: "I have difficulties in the following areas during lectures and tutorials: It is difficult to listen and understand other students' answers; for example, when lecturers ask questions, we don't understand the student's response and we all hope that the answer is wrong so that the lecturer can give the correct answer." And another Chinese student's response: "We don't understand what the lecturer is saying; he often goes off topic and doesn't give examples." When asked whether she tried to contact the lecturer for further explanation, she answered: "I don't know if I'm allowed to see the lecturer." After analysing all the participants responses, it became apparent that they could not apply what they were learning (theories) to authentic situations, they simply could not see the link, and everything remained relatively disconnected. In the final question of this section, students were asked how academic staff could help them. The key responses were: "I wish the teachers would give us a sample of the work they want from us. It is very difficult to work out what the lecturer wants." And "I wish our lecturers could provide all students sample essay/exam questions with answers to guide students on how to answer." "Why do they (lecturers) ask me to write my own opinion? How can I do that? They tell me, 'You cannot use '*I*'. Why should I have my own opinion? They should tell us what we need to know so that we can pass the exams. But they don't do that." Which, according to Tait (2010) is "a surface approach to learning brought about by a desire to do no more work than is needed to pass" (p. 264). On the other hand, Miller (2007) grouping all Asian languages in the oriental rhetoric, explains that 'Asian writers work to present details without explanation of the connections between them or their connection to a main idea" (pp. 5-6). One Indian MBA student rightly stressed: "I can't find the answers for my essay question in my textbook and the lecturer is not indicating the passage in which we can find the answers. I think this lecturer does not know the answers either". Chuah (2010) clearly identifying the problem, wrote "[…] they expect the lecturer to tell them exactly which page to read in exactly which books, exactly what to include in an essay or exactly how to structure the essay." All the students involved in the interview said that their only concern was to get their degree and that obtaining a pass was good enough. One Chinese student commenting on grades said: "Nobody looks at my grades: employers will look at my degree and if it is a Western one, then I will climb the career ladder quickly". On the other hand, following discussions with teaching staff there emerged common views regarding their international Asian students: they described the students as passive, completely disengaged, lacking English language skills and concluded that therefore, they could not comprehend the basic requirements of academic writing. This Asian student passivity and lack of engagement has been widely explained in literature (Chuah, 2010; Gupta, Williams & Leslie, 2006; World Trade Press, 2010). Instead of "addressing students' academic learning skills themselves" (Tapper & Gruba, 2000, p. 56), the students who show signs of deficiencies are sent to see an academic skills adviser, in other words, they are sent to the "...crash repair workshop where welding, panel-beating and polishing ... takes place" (Chanock, 2007, p. 273).

Time Constraints and Financial Factors

The third reported factor was lack of time and financial pressures. For many Asian students, having a recognised Western degree is highly valued as it will give them a head start in life. Therefore, families will often stretch their budget to provide a good Western education as guarantee for a better future. All the students originating from India indicated that they would bring 'shame' to their own families if they did not succeed. During an interview, one outspoken MBA student said: "My friend failed one MBA unit last year and his family asked him to return back home immediately." He further

explained that for many wealthy Indian parents failure was out of the question indicating "If I don't pass all my units, I will have to go back home, I am really terrified. Everybody will identify me as a good-for-nothing. I need to... I have to pass, otherwise, I'm finished". Quite clearly, failure for this student meant the end of the world. Eighty-seven percent of the students reported of their fear of failing a subject and thus bringing shame to their families. These views, namely, that education correlates with a better career and future for themselves and families are particularly relevant (The Economist, 2003). The pressure of performing well in an alien environment has deep emotional effects on these international students, however, they will not seek help unless they are in a safe and trusted environment. As well, the results indicate that students need time to adapt to their new learning environment and all participants indicated that they were overwhelmed by the demands of their studies.

Emotional Factors

Whilst most students identified the need for more support and understanding from their lecturers, they also indicated that they felt lonely and isolated from other ethnic groups. The feelings of exclusion and isolation were particularly felt by all female participants. Male participants, although acknowledging factors of exclusion by other ethnic groups and especially by local students, did not feel too strongly about it. One female respondent said "I think the local students don't want us because we don't speak good English, so for group work they avoid us or ignore us if we are in the same group. They think we will lower their grades." One Chinese student bluntly said "Nobody cares about us." Another student (Indonesian) highlighted the fact that some tutors paired students from the same culture but, facing the same difficulties, they could not help each other. All female students voiced their feelings of loneliness and homesickness whereas male students did not feel that this was a serious issue. Only the Burmese students were fearful of being sent back home.

Despite the consequences and factors impeding their learning journey, notwithstanding the large sums they have to pay to obtain a Western qualification, these students remain respectful towards their lecturers and tutors.

Challenges in Teaching and Learning Support

Whether located onshore or offshore, Australian universities offering teaching and learning support to their international students are numerous. The number of academic skills advisers providing support in any given Australian institution depends on many variables such as the number of its students, financial priorities (for further explanation, see Avirutha, Bui, Goodstone, Reid, Rendon & Johnson, 2005; Marginson, 2002) and the perceived value of teaching and learning support. These academic support advisers need more than just their areas of specialised expertise to meet the educational and personal needs of the diverse student population and culture. Regardless of what the student is studying or the level of difficulties encountered, teaching and learning support must be flexible, expert in academic literacies and carry a multitude of roles (Gremmo, 1995). They need to have excellent communication and interpersonal skills to work with undergraduate, postgraduate, local and transnational students across the disciplines and offer individual consultations as well as workshops, as in the case of this study. These workshops should ideally include academic language and writing conventions, research, time management, exam preparation, presentation skills, critical reading and writing. Chanock (2007) has rightly stressed that despite 60 percent of advisers in Australian universities are considered 'academics' (the remaining 40 percent are classified as 'teachers' or 'general staff'), their "teaching loads are typically heavier than those of academics in the disciplines." (pp. 272-273).

In the eyes of the students, they are seen as a "quick fix" (Stevensson & Kokkinn, 2007, p. 48) 'problem-solving aid', 'pressurizer' and even as 'companion' (Pemberton, Toogood, Ho & Lam, 2001). However, the challenging tasks faced by many are to 'diagnose' and 'fix' problems 'repair' malfunctions, 'rectify' misunderstandings, and are viewed by academics as a 'cure-all' for academically 'dysfunctional' students. Their professional status is undermined as they are placed at the periphery of academia. Teaching and learning support is seen as a 'panacea' to 'treat' and eventually 'cure' all academic learning 'ills', whether it be linguistic, cognitive or affective. The expectations are boundless: they should know all types of academic discourse and conventions of all disciplines.

Conclusion

Mapped out by the contextual and theoretical frameworks, several key issues are identified in this research. Whilst the challenges faced across Asian culture and various study programs were based on interviews with international students, the results have a good fit with the literature and research. The complexities and multi-layered nature of difficulties experienced by international students are more

intense for particular cultures and most feel similar pressures and share the same fears. These views are further supported by Pedersen, Draguns, Lonner and Trimble's findings. (1996). Likewise, as Bradley (2000) indicates "The majority of students said relationship problems, feelings of isolation, homesickness, academic pressures, finance and accommodation were likely to contribute to difficulties." (p. 425).

This study explores the linguistic and non-linguistic features negatively affecting the progress of transnational students, the attitudes and expectations of academic teaching staff and the challenges teaching and learning support is facing in an Australian university campus based in Singapore. The results of this study indicate that there are no major differences between the Chinese, Indian, Indonesian and Burmese learner. This study highlights the need for Anglo-Saxon universities operating offshore to recognise that the viability of their programs and the academic success of their students depend on several factors. First, the need to understand the pedagogical and cultural challenges students are facing. Second, that there is a positive correlation between English language competence and academic success. Third, that first year students in particular are struggling in meeting the demands of their academic subjects. NESB students need a range of academic skills to help them overcome their lack of competency especially, in understanding key concepts and to transmit their knowledge in written and oral forms.

This study looks at the major issues facing an Australian university campus delivering transnational higher education in Singapore. What is needed is an appropriately conceived and developed training program, especially for local academic staff with qualifications from a non-Australian education system, to change the one-dimensional view of their students' learning issues. Further training can lead to a better and improved teaching approach that addresses the needs of a multi-cultural student population. Additionally, to "bringing the foreigners up to speed" (Haigh, 2002, p. 37) more work needs to be done such as offering an academic literacies bridging programme to ensure a smooth intercultural transition of Asian students into a Western education system. Lastly, the multi-dimensional work academic literacies and language advisers working in the context of teaching and learning support, calls for a better understanding of what they are expected to provide and the construction of their roles.

Acknowledgment

The authors wish to thank all participants in this study for their willingness to reflect on and share their experiences.

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CHEATING AND THE USE OF TECHNOLOGY BY HIGH SCHOOL AGE STUDENTS

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Abstract

Technology continues to advance and young people tend to be early adopters of technology. This is a potent combination on a number of levels, including the combining of cheating with technology, a subject that has garnered increased attention and has increased importance and relevance. Beyond the schoolhouse, it seems cheating has become endemic in the corporate world and government. But it is wise to remember that big cheaters were once little cheaters, most likely starting as school aged children who did not get caught or did not receive proper and ethical guidance from role models. This paper explores reasons high school students cheat, how they use technology to do it, what constitutes cheating, and how educators can lessen cheating in schools. A literature review is supplemented by personal observations of the author and his experience over 35 years as an educator and researcher.

Introduction

I chose to study the phenomenon of cheating in schools, especially as it incorporates technology, for the following three reasons:

1) The rapid increase in technology and its use in daily life by young people.
2) The harm that is done to society by cheaters.
3) My belief that large scale cheaters started out small and it is to the benefit of all to nip them in the bud.

Let's start off with a straightforward question: What is cheating? The word cheating is a derivative of the word *escheat*, from the Old French meaning "to fall to one's share" combined with *es*, used in French to designate "escape." The original use referred to a situation if a person died with no heirs. In such a case the property of the deceased reverted to the crown. In the eyes of some this was a confiscation by the government of undeserved assets which, understandably, relates to our current understanding of what it means to cheat. Another common and current definition of cheating is "a deception for profit to yourself."

Cheating has been around as long as mankind and as you might expect has received scrutiny from some notable sources. Well known utterances about cheating abound, as evidence by these from between 200 and 3,000 years ago: "He'll cheat without scruple, who can without fear." (Benjamin Franklin, American statesman, 1706-1790); "Bread of deceit is sweet to a man; but afterwards his mouth shall be filled with gravel." (Proverbs 20:17); and, lastly, "I would prefer even to fail with honor than to win by cheating." (Sophocles, Greek tragedian, 497-406 BC). These statements show that cheating is not a new topic and has been a concern for centuries.

A primary lesson that may be deduced is that human behavior really does not change over time. Here is one more last quote before moving on to modern times: "The children now love luxury. They have bad manners, contempt for authority, they show disrespect to their elders. They contradict their parents and are tyrants over their teachers." While many people would ascribe those words to any current day exasperated parent, they were uttered by Plato, 2,500 years ago.

Next we will examine some current literature on the subject of cheating and technology, followed by the gray area of cheating and trying to determine when students cross the line. I will then list 17 reasons that students cheat and close with some suggestions on what school leaders can do to lessen cheating in their buildings.

Literature Review

There have been many studies about cheating in high school, the methods used, the role of technology, and the disposition of the cheaters. Lathrop and Foss (2000) reported three reasons why young students chose to cheat: (1) Cheating is easy with technology such as the Internet; (2) The odds of being caught are low; and, (3) Those who are caught do not receive severe punishment (p. 1).

The Pew Internet & American Life Project (http://www.pewinternet.org) found in 2005 that while there is "agreement among teens and their parents about the role that the internet plays in teens' education (88% of online teens believe that the Internet helps teenagers to do better in school and 83% of parents of online teens agreed with that proposition, there is more of a disagreement when it comes to use of the internet for cheating on schoolwork. Some 37% of teens said that "too many" teens today use the internet to cheat on schoolwork. That compares to 27% of parents who say the same thing." This may indicate that as is often the case with parents and children, the youngsters are ahead of the curve.

Another large-scale contributor to the field is the Josephson Institute (http://www.josephsoninstitute.org). Among its key findings on the topic at hand are:

(1) Teens 17 or under are five times more likely than those over 50 to hold the cynical belief that lying and cheating are necessary to succeed (51% v 10%);
(2) Regardless of current age, people who cheated on exams in high school two or more times are considerably more likely to be dishonest later in life;
(3) High School Cheating: Those who admitted cheating on exams in high school are three times more likely to misrepresent or omit facts in a job interview than those who did not cheat (12% v. 4%); and
(4) The vast majority of respondents of all ages believe that young people lie, cheat and steal more than previous generations but teens and young adults are considerably more likely to believe this than older adults.

Methodology

There were two methods used in this exploration and status report: (1) A literature review; and (2) anecdotal conversations and observations. The literature review was comprised of academic papers and, especially, surveys, such as by the Pew Internet & American Life Project and the Josephson Institute. The anecdotal contributions come from 35 years of working with teachers, students, and principals by the author.

Findings

The motivations for cheating and the role of technology in it are varied. Obvious reasons include "to get a better grade" and the ubiquitous "everyone does it." But it goes far beyond that. My research and observations have resulted in 17 different reasons why students cheat. Principals, teachers, and students also report multiple motivations on why secondary schoolers cheat. My contact has been primarily with educational leaders at the secondary school level and in traditional public American schools.

Why Students Cheat

The ultimate goal of cheating in a high school situation normally, but not always, is to get a better grade on a test or project. But as noted, the reasons are varied:

1) Pressure to get good grades to get into a "good" college.
   Students are often under pressure to gain admittance to an elite university. This pressure can come from peers, "society," and quite often, parents. One of the primary criteria for gaining entry to these institutions is grade point average (source). Hence, students who may fall short may turn to cheating.

2) "Everyone does it."
   There is sometimes a perception that something is more common than perhaps it is. Young people who hear the refrain "everyone does it" may be more apt to succumb to cheating than they would be otherwise.

3) Too much work due at the same time.
   This is a logistical problem. Students report and principals confirm that there is often not a coordinated testing schedule at the high school level. In other words, students may find several projects due the same week or tests on different subjects the same day. As a result they turn to cheating.

4) Grown-ups cheat and lie, especially in business and politics (so it's OK that we do, too).
   Large-scale cheaters and scammers like Bernard Madoff and scores of politicians on all levels of government have been exposed. These individuals are who young people read about and see on television.

5) Don't care about the subject.
   The thinking here is "I don't care about this subject at all. I'm going to take the easy way out."

6) It's just so easy – crimes of opportunity.
   As with #3 above, this is something of a logistical problem, plus a lack of training and awareness by teachers and other school leaders. If the barn door is left open and the horses wander out, is anyone surprised?

7) Ignorance, the rules are not clear.
   Especially with the advent of increasingly sophisticated Internet resources, opportunities, and utilization, this becomes a hard area, what actually constitutes cheating?

8) Prone to cheat and/or lazy.
   We cannot leave this one out. Some people just seem to be born this way. I am not saying a criminal disposition is the same thing as laziness, just that these are two constructs or traits that some people seem to have as part of their genetic makeup.

9) Low self esteem – lack of confidence that passing is even possible.
   Unfortunate students who have had little success and otherwise low self-esteem may resort to cheating to make up for this.

10) To maintain athletic or other eligibility.
    Athletic and other extracurriculars often require a maintenance of certain academic standards. In order to keep eligibility, cheating can be a tool used.

11) Poor teaching.
    This is probably not the first reason for cheating that comes to mind, especially for educators. But some students report that if the teaching quality had been higher, the incidents of cheating would be lower.

12) Esteem is *too* high--I don't need this.
Some people seem to have a sense of entitlement, that working hard to obtain an honest grade is simply below them.

13) To cover a disability.
A student may resort to cheating to cover a disability, such as a vision problem or learning disability.

14) For the thrill of it.
There can be a level of excitement related to cheating that some find hard to resist.

15) Peer pressure.
Related to #2 above, but more specific. In this case it is cohorts who put the pressure on someone who may or may not otherwise be prone to cheating.

16) "Better to cheat than repeat."
If the choice is to cheat or repeat a class, cheating may be the option of choice.

17) The challenge (technologically) of it.
As discussed elsewhere in this paper, the world of technology has opened many avenues for "creative" cheating. Just as some people find a challenge in developing applications or hardware, others find their challenge in discovering new ways to cheat.

Technology and Cheating

Yesterday's technology for classroom deception may have involved "crib" notes written on the palm of a hand or on a piece of concealed paper. In some ways, while the dizzying pace of technological progress can seem overwhelming, the basic precepts and methods are still the same. For example, while only a small amount of data could be concealed on a hidden piece of paper, the same idea today can results in access via a smart phone, for example, to absolutely uncapped amounts of information. Same idea, different conduit.

Wireless devices, especially cell phones, are often tools of choice for today's young cheaters. The typical smart phone has capabilities that many veteran teachers simply are unprepared for. This includes cameras, memory capacity, speed, Internet connections, and, of course, communication abilities (to and from other students in or outside the classroom, for example).

With the stakes higher than ever for young people, especially in areas such as standardized tests, where scores can determine the quality or status of college for which a student may be accepted, students may be more susceptible to using inappropriate technologies than they may otherwise be.

Adding to the problem are (1) the rampant use of technologies such as YouTube that students utilize for cheating strategies and tips; and (2) web sites dedicated to helping students circumvent their academic duties, including http://www.schoolsucks.com and http://writework.com. A quick search of YouTube, for example, identified short videos intended to help students cheat titled "how to cheat on any test," "how to cheat on a test final," "how to cheat in a test using a coke bottle," "how to cheat in exams," and "how to cheat on any test easy" as only a handful of many choices. One contributor identified as HouseholdHacker seemed to almost corner the market on cheating videos and was among the most popular with a signature video that had been viewed 6,598,727 (as of May 2011) times.

When Does the Student Cross the Line?

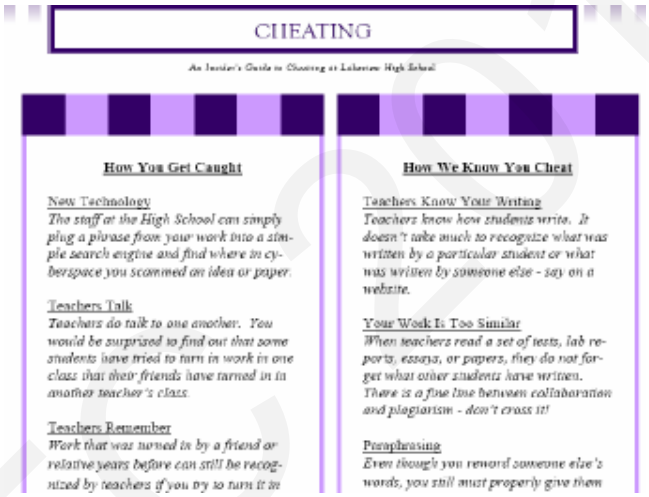
Regarding technology in general and the Internet specifically, it can be confusing for young people to understand and know when they have "crossed the line" from legitimate reporting of research to something that falls into a gray area or even something considered unethical. The most simple example of this is the

common practice of "cutting and pasting" for reports. In days gone by, this was done by lifting passages from previously written papers. Today, of course, with the Internet the possible sources for papers have exponentially expanded as have the abilities to lift verbatim.

It is my opinion that young people often do not realize that they are, in effect, cheating. There are two main ways to combat this, both basically involving education: (1) The use of a good style manual, such as the Publication Manual, 6th edition, of the American Psychological Association, and (2) a clear student handbook in the high school setting.

One example of clear language from a high school handbook can be found in the Lakeview (Michigan) high school handbook.

Figure 1
Lakeview (Michigan) High School Student Handbook



CHEATING

An Insider's Guide to Cheating at Lakeview High School

How You Get Caught

New Technology
The staff at the High School can simply plug a phrase from your work into a simple search engine and find where in cyberspace you scammed an idea or paper.

Teachers Talk
Teachers do talk to one another. You would be surprised to find out that some students have tried to turn in work in one class that their friends have turned in in another teacher's class.

Teachers Remember
Work that was turned in by a friend or relative years before can still be recognized by teachers if you try to turn it in

How We Know You Cheat

Teachers Know Your Writing
Teachers know how students write. It doesn't take much to recognize what was written by a particular student or what was written by someone else - say on a website.

Your Work Is Too Similar
When teachers read a set of tests, lab reports, essays, or papers, they do not forget what other students have written. There is a fine line between collaboration and plagiarism - don't cross it!

Paraphrasing
Even though you reword someone else's words, you still must properly give them

Student handbooks are a frontline tool to combat unethical behaviors such as cheating. Most students receive handbooks at the start of the school year and they are discussed at that time. It is common for parents to receive the handbooks, as well, and often parents and students are asked to sign for them indicating that they have read and understand key school policies and procedures.

How School Leaders Can Lessen Cheating

I strongly believe there is much that can be done to lessen cheating by young people and that the technological "advantages" they have can be muted. Methods schools can use to lessen cheating include:

1) The most powerful method of all: Communication. By modeling and explaining what constitutes honest and ethical behavior school leaders and teachers can have a profound impact on student behavior.

2) Awareness. Teachers need to be cognizant of how students use technology to cheat and the reasons that they cheat. This does not have to be overly complicated. Limiting access to cell phones, for example, can go a long way to lessen cheating. Walking around the room by the teacher has lessened cheating since classrooms were first organized.

3) Employ technology. On a slightly more advanced level, "jamming" technology to prevent communication can be employed. For papers and written projects, sophisticated software applications such as http://www.turnitin.com and http://www.respondus.com/products/lockdown.shtml, which allows more secure online testing.

4) Punishment. Research shows that consistent enforcement of policies can lessen cheating.

5) Clear expectations. Related to communication above, the setting and embedding of clear expectations for academic honesty help to establish a culture where ethical behavior among students is more of a norm.

Conclusion

Cheating is epidemic and more technologically sophisticated than ever. This is true in high schools and society at large. While the situation may be discouraging in some respects, there is reason for optimism as well. The primary way to stop cheating is communication, teachers explaining and modeling ethical behavior. Other powerful methods include using technology to identify and prevent cheating, old-fashioned teacher awareness and proactive stances such as walking around the room and carefully reviewing work, and punishing cheaters.

In my opinion, the greatest area of need for school leaders and anyone concerned with cheating is the lack of understanding of the motivations for this behavior. Expectations, communication, punishment, and prevention all have important roles. But understanding motivation for cheating is an underdeveloped tool that can be improved and lead to better behavior and a more satisfying teaching and learning environment.

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COMPARING THE IMPACT OF TEACHING BY VIRTUAL TEACHER(ONLINE TEACHING) AND REAL TEACHER ON STUDENTS LEARNING IN REAL CLASSROOMS

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ABSTRACT

The purpose of this research was to compare the impact of teaching by virtual teacher and real teacher on students learning in a classroom. the research method was experimental .The population was all of the students of Islamic Azad University of Marvdasht which was 13158 persons in year 88-89.The sample(80 persons) was selected by cluster random sampling and devided to 2 different group with the size of 40 persons . one group was control group and the other was treatment group. A researcher made test with 40 question was used to conduct this research. Pre- test , post –test and test of stability of learning was performed for both group and the results were analyzed by using T – test. Based on the results of this research , we can use virtual teacher where there is no access to real teachers, the quality of learning in teaching by virtual teacher(online teaching) was as the same of learning by real teacher, in real classrooms we can use virtual teachers instead of real teachers, and the stability of learning in both methods of teaching was the same.

INTRODUCTION

There are two types of virtual- trainings category according to communication: the first type: inside- school planning that is about the method in which students are trained by internet in education place as collective and under responsible observation. And the second type: outside- school planning (which is more common). In this method, people are connected to internet and trained in their houses or even in their work place.

Sarmadi (2005)stated that virtual- based teacher training is a kind of education and learning in which teacher and student are separated geographically. Therefore, it is lied on computer and internet to give educational services by means of assisted- training and electronic tools such as printed texts. It is hard and- in certain cases- impossible to provide expert and skilled professors typically for remote university from related centers due to various reasons such as to be New and old some educational fields inside of country or complexity of some lessons.

So that it isn't provided these majors and units or theses are taught by professors who are not specialist in these majors.

In any case, these cause to make scientific harms in country's universities. Frank (2000) showed that all teachers who are participated in virtual training, they consider virtual learning as element to power and enable students; and they account its advantage as active learning, critical thought, cooperation, self-steam and accustom to permanent learning.

(Mehrpoya, 2004) stated that inside- school remote training plans are applied to support education in schools where there aren't any learning materials. These plans can be also applied in place where teachers don't have formal abilities or to support schools where have few students that it is impossible to organize traditional education.

Now, Is it observed any difference between training via virtual teacher or genuine one as learning quality?

Can be used on-line virtual teacher in university's actual classrooms instead of genuine teacher in respect to existing developed technology of computer sciences typically Internet high- speed lines in country's universities? In another words, can be use virtual professors to eliminate lack of expert professors? These are problems which are contained in this study.

Baras and oven(2000)believe the increasingly growth of today's technology and science want new learning and teaching methods. use of teacher viewpoint, the only wise of teaching scene, as another old and despicable ideas. Students must play more active role in learning and teaching and teacher should changes into guidance person, facilitated, arbitrator and educational designer. It is hard to realize in a physical class with fixed space and determined time and conditions of traditional education. Live training based on classroom will make high expense. Then in electronical training, the people are able to learn their required information in each hour of day and in throughout the week. In electronic training, it is decreased traffic expenses and ones related to professors and consulters, and it is prevented to waste time. Hence, it seems necessary to study the possibility in create these types of educations about efficiency and effectiveness of these training.

Miller (1993), who is one of theorists in curriculum plan, has identified four long- time procedures in remote education in universities. He has predicted observed changes in remote training in global level. These cases are included: coincide diversity and convergence of technology with outcomes to design course, design curriculum, organizing policies of resource investment and etc, variant relations with students by more emphasis on collective relations, alteration of time control, study speed and place, variant relations between institutes by make some consortium to share resources, degrees provisions and national programs, specialized national universities or university plans. New- found main flow means that remote- training shows more extensive changes in educational paradigm; this is place where educational institutes are corporate with social evolve currents, and New substructure of technology and alterations in main learning- teaching communications.

Keegan (2000) outlines virtual educational features as follow:

Extrication from scheduled classes; escape from closed places; extrication from time limitations; escape from join to educational groups in order to learn; training for house- keepers and training for hospitalized, shift, passengers and jails individuals.

Kashiha,and Kashiha(2006), According to quick evolution in information arena human knowledge, hasting knowledge production current and flow of obsolesce present knowledge, emphasize that curriculum must focus on purposes about how to learn and teach permanently more than before. So that, the students should be architecture and designer and designer of growth and development flow, and it must be noticed to active presence of students.

Mehr Mohammadi,(2004) mentioned that the learning isn't just confined to whatever is done in class. Use of technology in order to expand and develop training and education will be resulted in huge attack of numerous advantages for all people.

Gits (1999)stated that if learning means change in person's potential and ipso facto behavior, then it will be done by better technology. Yaghma, (2009) believes that educational technology bases (such as virtual training) is base on behaviorism psychology. In training technology, it is considered amplification and depth of prior taughts, self- evaluation and reflection receive, discover required information, laboratory activities performance in virtual environments, knowledge production and creative performance, by use of electronic tools and also communication with scientific centers inside and outside of country.

Noroozi, zandi and Moosavi Madani (2006) try to study the research as title of ranking of information technology application method in school learning – teaching process, and by purpose of study various procedures in use of information technology in learning process, and they concluded that suitable method to apply information technology in learning process- in public course- is utilization of self- study multimedia softwares and their simulations. While there are internet- based methods for academies and high- school course.

Talebzadeh (2006) in research as title of: "effectiveness study of remote counters and their curriculum in high- school level in through out the country in 84-85 concluded that remote- training activities adjust to defined purposes and issued ones via education ministry.

Esfijani (2003) performed the research as title of: "the study of education and training effect by help of in formation media on educational motivation of girl students in second- grade of guidance school level in Tehran education fourteen region. In this research, He has compared two groups of students (experiment and evidence) by use of two- group experimental research method with pre- and post-examination. Experiment and evidence groups are trained by virtual training via Network, and by

traditional method, respectively. The results showed that Network- based training is successful and it has positive effect on students educational Motivation.

Marinyo Marinsko‹ youvrl Marinsko and Nikoula pap vi cae (2008) concluded below results in research as title "viewpoint about local training and remote one by aid of computer. Use of computer in order to train has become more obvious in educational contents and learning process; and it as stated as a substitute for classic viewpoint which its purpose is presentation of individual training instead of collective training. Based on this, internet has given very strategies and fundamental substitute cases which have substitution capability with classic training systems. This means to have noticeable advantage in the field of remote training system, so that it has been prepared actual development to complete or even to substitute professors due to extensive equipments in order to save information in Large archive files.

Vilhm (2003) has performed one investigation as title of: "virtual learning in term of university students at lova states. He demonstrated that most of students have had positive experience from virtual classes and they stated that learning has been optimum in virtual classes like traditional common classes.

Nafisi,(2004) concluded below results in research as title of: "educational innovational experiences based on information technology". This suggest that educational responsible can utilize various tools of information technology such as computer, local Network, internet in any conditions to improve learning-teaching process. And this require that they believe the role of "guidance at the side, no wise in the scene."

RESEARCH PURPOSES

the main purpose of this research was to compare the impact of teaching by virtual teacher and real teacher on students learning in a classroom. The partial purposes are included:

1- the study of possibility to establish actual classes by use of virtual teacher with optimum quality in learning process.

2- comparison study of learning quality via virtual teacher training with personal teacher.

3- study of virtual teachers applications instead of real teachers.

4- comparison study of learning permanent rate resulting from virtual training with learning from traditional education.

Research hypotheses:

1- it can be used online virtual professors to eliminate lack of expert professors in university units.

2- Learning quality resulting from online virtual teacher is equal with their learning via real teacher.

3- it can be used virtual teacher in educational spaces instead of real teacher.

4- the rate of resistance in learning from virtual training is equal with that of traditional training.

RESEARCH METHOD

based on statistical population of this research, all university students of lslamic Azad university of Marvdasht are 13158 people (in educational year 2008-2009), who 80 people were selected as sample by random sampling method from students in various educational levels and fields.

since the purpose of this research is to access applicable and operative outcome in the field of innovation of typical sort of education named virtual training as concentrated one, so that this is applied research. And since it has been used organized randomly method to choose trials and whereas in experimental and dummy environment, it is controlled variables and studied trials, so that it is kind of experimental research. Also, because its results are obtained after changing variables i.e in future; as a result, this is providential research. So this research generally is experimental, applicable, and providential research.

When these groups are located in two separate classes, it was tested a teacher made test with 40 questions performed for them . Then, at the same time, the control and experimental groups classes are trained by traditional method and on line video conference in another class, respectively. Then it was tested second exam on both groups by teacher made test. After two weeks it was tested learning stability exam in order to study trials learning stability and then datum were analyzed by statistical methods. In this research, it has been used pre- and post- examination project with control group from actual experiment research project. So that it is compared the rate of trials knowledge rate in experimental and control groups before and after independence variable on experiment group.

As a result, it is known the rate of independence variable effect on experiment group.

The design of pre- and post- examination with control group.

RE	T 1	*	T 2
RC	T 1	–	T 2

Data collecting instrument:

3-teacher- made 4-choices tests used to conduct this research with guidance of expert professors . Chronbach Alpha for tests were .87, .85 and .81 .

data analysis methods:

In description statistical level:T test for independent groups were used to analyze datum

RESERCH FINDING

first hypothesis:

it is applied on line virtual professors to eliminate lack of expert professors in university units. It has bee used t- test of independent groups to study this hypothesis. It is observed that the amount of t becomes equal to 32/22 which this amount is at 0.0001 significant level, as score average of post- exam in experimental group is higher than score average of pre- exam in this group, so this hypothesis has been admitted .

Table number 1

group	Number	Average	Standard deviation	T	df	Significient level
Pre-test	40	6/95	3/75	32/88	39	0/0001
Post-test	40	13/5	5/85			

Second hypothesis:

learning quality of students resulting from training via online virtual- based teacher is equal with their learning by actual teacher. In study of this hypothesis test, the amount of t is equivalent to 9026 and it is significant at 0.0001 level and as this difference due to post- test cores average dominance relative to pre- test in experiment group, them this result suggest to approve this hypothesis.

Table number 2

group	Number	Average	Standard deviation	T	df	Significient level
Pre-test	40	6/55	1/25	9/26	78	0/0001
Post-test	40	4/2	0/99			

Third hypothesis:

it can be used virtual teacher in educational spaces instead of actual teacher. It has Been used independent groups in order to study this hypothesis form t-test . It is observed that the amount of it becomes equal to 32/88 and it is significant at 0.0001 level and according to post-exam scores average in experiment group which higher than pre-exam ones in this group, so this hypothesis approved .

Table number 3

group	Number	Average	Standard deviation	T	df	Significient level
Pre-test	40	6/95	3/75	32/88	39	0/0001
Post-test	40	13/5	2/85			

Fourth hypo thesis :

The stability of learning of virtual learning is equal to learning resulting form traditional training .

In study of this hypothesis , it is observed that the amount of t is equal to 1.04 an it isn't significant at 0.29 level. This shows that there isn't any difference in stability of taught rate of both group. As a result , the rate of stability is equal in both procedure so this hypothesis is accepted by.(table 4).

Table number 4

group	Number	Average	Standard deviation	T	df	Significient level
Pre-test	40	-2	0/81	1/04	78	0/29
Post-test	40	-2/52	3/06			

DISCUSSION AND CONCLUSION

This research has been performed by main purpose of comparing the effect of virtual training teacher (on line) with personal teacher training on students learning in actual classes.

Based on finding of this research , it can be used on line virtual professors in order to eliminate lack of expert professors in university units . This result is according to baras and aven ideas .

They believe that increasingly growth of modern science and technology want new learning and teaching methods . The students must play more active role in learning and teaching process and the teacher should be changed into guidance in scene aside , facilitator , arbitrator and educational designer . Its realization in one physical class with fixed space and determined time and traditional training condition is very hard .

Live based-classroom educations will make high expense for performers . So in electronic training , the people are able to learn their required information in any hour of day and in throughout the week .

In electronic training , it is decreased traffic expenses and these of related to professors and is prevented to waste time . Hence , it is necessary to study the possibility of creating this kind of education about efficiency and the effectiveness of training .

In second hypothesis , we concluded that the quality of student learning resulting form training via virtual teacher (on line) is equal to their learning via actual teacher . Vilhm (2003) in similar results showed that most of students have positive experience form virtual classes .

They stated that the learning has been optimum in traditional common classes like virtual classes . Esfijani (2003) , in a research , demonstrated that training via network is also successful and it has had positive effect on educational motive .

In third hypothesis : It can be used virtual teacher in educational spaces instead of actual teacher .

Nafisi (1383) concluded similar result by doing one research . It is suggested that education technology such as computer , local network & internet to improve learning teaching process in any condition .

This required that they believe role of 'guidance at the side, no wise in the scene'.

And fourth hypothisis means that rate of permanency in learning form virtual training is equal to traditional training . According to Yaghma (2002) which is stated in training technology magazine : Bases of training technology (such as virtual training) is on the basis of behaviorism psychology . In educational technology , it is considered reinforcement dud support of previous taught , self-evaluation , receive reflection , discovery of required information ,experimental-workshop activities performance in virtual environment , knowledge production and creative presentation by use of electronic instruments and also communication with scientific centers inside and outside of country .

RECOMMENDATIONS

based on research finding it is recommended that:

1- In respect to rate of resistance in optimum learning in this training , all universities and educational centers are equipped to necessary facilities in this field,

2- It can be used virtual teacher to teach in respect to lack of expert professors in certain majors in order to participate in class ,

3- Various groups use one lesson at the same time,

4- the teacher teaches several class in one time and in several place in order to decrease in traffic expenses and waste time.

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COMPUTER SELF EFFICACY: TEACHER READINESS IN ACCEPTING MALAYSIAN EDUWEBTV

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Abstract

The role of Library and Media Teacher (LMT) as a catalyst for the implementation to the technology programs conducted in schools is a challenge to the LMT which is to be more open and innovative towards innovations introduced in schools from time to time. This study is to determine the level of computer self-efficacy (CSE) of the Library and Media Teacher (LMT) and to see its relations with the acceptance of EduwebTV a new innovation that has been implemented. The study involved 546 LMT randomly selected from four states in Malaysia The findings showed that the level of computer self-efficacy (CSE) of the LMT to use the EduwebTV is moderate compare to their confidence to disseminate the EduwebTV innovation. The analysis also showed a positive correlation to the perceived ease of use and perceived usefulness in acceptance of EduwebTV innovation. From these findings we can conclude that the computer self-efficacy of teachers may help to influence their perception of ease of use and usefulness of EduwebTV where it is important in this process of innovation acceptance.

Keyword: *Computer Self Efficacy, Innovation acceptance, EduwebTV, Library and Media Teacher*

INTRODUCTION

Changes in information and communications technology (ICT) will bring great challenges to the teaching profession. Teachers should be willing to increase their knowledge and skills to use the computer technology in teaching and learning and to replace the conventional approach which is low in technological innovation. In this era of information and communications technology, several changes and innovations have occurred in the education sector. Learning paradigm based on the usage of source material as a source of reference has been changed to take advantage of electronic information resources as an alternative in school. In line with this development, the teachers need to be more open and willing to accept renewals of educational technology, introduced to schools such as SchoolNet project, School Internet Access Center, Learning CDs and EduwebTV. However, ICT program in teaching and learning in schools will be more easily implemented with the emphasis on the mastery of technology among teachers (Muhyiddin, 2010). Teachers need to be more receptive to reform and adapt to changes particularly teaching with technology. The important thing is that teachers must have the need to

change and want to change but if teachers do not adapt to change, not much of incentive will be able to change them.

BACKGROUND

EduwebTV innovation has been introduced by the Ministry of Education (MOE) especially in the effort to diversify the sources of materials for teaching and learning on March 2008. This technology is a renewal of the education TV program that was implemented in schools for nearly 36 years, from 1972 to 2008. This innovative is in the form of web portal and has eight (8) channels of News, Academic, Articles, Interviews, Curriculum, Interactive, Direct Broadcast and Directory. EduwebTV presence through this site is actually to overcome the problems often faced by teachers when using this media in teaching that have been broadcasted by Malaysia television broadcasting stations. Such broadcast program schedule is not consistent with class schedules, lack of television sets, broken television sets and many more. Thus this innovation bring comfort and more effective for learning through the web which allows teachers and students to access a range of information without the limitations of time and place, as well as Internet facilities available in schools. Hence its presence is an effort to increase more schools using information technology (IT) in daily activities and can help to reduce the digital gap between urban, suburban and rural area.

In the context of the diffusion of innovations in schools, the Education Ministry Circular KP (BS) 8591/J1d.XVII (6) dated July 28, 2003, has directed that technology equipment provided in schools, should be used to the maximum in the process of teaching and learning in the classroom. However, we realize that the diffusion of an innovation can not happen in a short time, according to Rogers (2003) the role of change agents can help to speed up the diffusion of innovation in the social system of an organization. Havelock (1995) also asserted that there are four important roles of the agents of change in helping innovations acceptance process, including its role as a catalyst for innovation, problem solver, an assistant to the process and as a link source. Certainly a change agent must have knowledge of an innovation that enables them to influence the results of his client to accept the innovations introduced. For the purpose of diffusing the EduwebTV innovation in school, Library and Media Teacher (LMT) has been introduced and exposed to EduwebTV by the ministry in an early launch hoping they can promote this innovation to the teachers and students in schools and willingly provide technical assistance if requested at any time while using the EduwebTV. Thus, the spreading is easily occurring. LMT role is not only managing resource materials (books), but their role is wide and challenging because resource materials that were introduced in schools are not only printed but also in form of electronic and Internet.

LMT should be able to serve as a catalyst in the implementation of innovative programs especially related to the use of media and technology. According to Yusof & Razmah, (2006) LMT role in schools is important because they help to the implementation of innovations, a problem solver and a link of source. Therefore, the LMT should be aware of a product to be promoted in advance or in other words they must be ready and confident to be in the category of "early adopters" which mean being an early user of EduwebTV compare to other teachers at the school and as individuals referred to concerning the EduwebTV innovation. According to Noraini et. al (2009) in the context of the diffusion of media materials in schools, the role of LMT is not only as an agent for promoting EduwebTV innovation but they are also consumers of EduwebTV especially in teaching and learning in the classroom. In fact, the LMT should be act as;

1. User of EduwebTV
    - Teachers who teach subjects in the classroom where they have the opportunity to provide students with experience using EduwebTV
2. Role model practically using the EduwebTV
    - Teachers' consistency in the practice of using EduwebTV as teaching aid in teaching can help diffusion occurs - when there is imitation of behaviour among members of the social system in schools
3. Catalyst in the process of accepting EduwebTV
    - Confidence to communicate about EduwebTV. Diffusion may occur through the communication (storytelling) word of mouth because they are considered individuals who can be consulted.
    - Confident in promoting and providing opinion on EduwebTV to customers (teachers and students). This is consistent with his role as an individual who referred to.

Computer Self-Efficacy as a basic need for acceptance of computer technology

In this study, the researcher refers to a model that is often used to describe the acceptance of technology that is *Technology Acceptance Model* (TAM). TAM model was introduced by Davis et al. (1989) and developed from psychological theory that explains how the behaviour of technology user is influenced by the belief, attitude, intention and link to user behaviour relationship (Abdalla, I., 2005, Lee, Y ., Kozar KA, & Larsenm, K.R.T, 2003). TAM has grown and become one of the most effective models to predict the acceptance of information technology. Many researchers have adopted TAM and have showed it has high validity (Chau, 1996.2001; Adams et al., 19 992; Igbaria et al., 1997; Venkatesh & Davis, 2000; Moon & Kim, 2001). According to Davis et al. (1989) there are various external factors to understand why people accept or reject the technology. Apart from that, they also propose individual characteristics or organizational features as external factors. Pedersen (2003) found that self-efficacy is one of the external factors in TAM contributing to technology acceptance in which self-efficacy can be viewed as an individual self-confidence in the ability to use a innovation to achieve a behaviour. In TAM, there are two variables i.e. perceived ease of use and perceived usefulness that will influence the behaviour of individual acceptance. Igbaria & Iivari (1995) explains that there is a strong relationship between self-efficacy and the perceived ease of use and perceived usefulness. Therefore, this study will examine the relationship of self-efficacy with the perceived ease of use and the perceived usefulness. Self-efficacy is defined as an assessment of the capability to manage and implement the choices in the actions required by the type and level of performance specified in the task (Bandura 1982, 1986).

In the process of accepting innovations related to information communications and technology, some teachers may feel that a method which was introduced is being renewal or regenerate, and can provide opportunities and inject some energy into education (Jones & Kelley 2003), but there are other teachers who see decision to accept and to use technology as an obligation that need to implement or respond to instructions from the organization (Ebersole & Vorndam 2003; Jones & Kelley 2003). According to Bandura (1977) self-efficacy can influence thinking, behaviour and actions of individuals, the quality of effort given by a person based on an activity and perseverance while facing obstacles or adverse situations. Individuals with high self-efficacy see a difficult task as a challenge that needs to be overcome and not trying to avoid it. They are intrinsically strong and totally focused on the activities, will set goals and challenges of maintaining a strong commitment to these activities.

According to Bandura (1989) the self-efficacy of confidence is a specific domain in which a question will arise that is; can I do this? Therefore, measuring self-efficacy should test the sole

criteria that need to be tested. In this theory, the self-efficacy is the antecedent to the use of technology. Copping emotionally like perception and anxiety are affected by the self-efficacy. Thus attitude with confidence and high efficacy can help the process of acceptance and use of technology in teaching and learning. Compeau and Higgins (1999) have used models based on cognitive theory developed by Bandura to test the influence of computer self-efficacy, expectations of result, interest or attention, and anxiety on the use of computers. Hence, higher self computer efficacy can help the ease process of acceptance and use of ICT in teaching and learning.

Many studies have focused on the impact of computer self-efficacy in the context of management information systems and have been proven to affect users of technology acceptance (Venkatesh 2000, Ramayah et al. 2004, Ramayah & Bushra 2004). According to Torkzadeh and Dyke (2002), self-efficacy construct is very useful as the basis for measuring the development of individual self-acceptance and measuring the ability in the use of Internet in teaching and learning. In fact, it is also expected to affect the determination and strength in doing assignments and can demonstrate the interest and level of difficulty chosen to do something (Gist 1987). Albion (1999). Moersch (2001) found that teachers' confidence, especially teacher self-efficacy is a significant factor in determining the ability of teachers to integrate technology in teaching. Teachers who have low self-efficacy usually choose the method that is easy to implement, but individual with high self-efficacy tends to be interested in the difficult tasks and view it as a challenge that can be measured and not a threat that should be avoided (Orpen 1995; Pajres 1996). Albion (1999) suggests an ideal way to enhance teachers' efficacy on the use of ICT by providing training in ICT skills.

STATEMENT OF PROBLEMS

As any other innovation projects, EduwebTV is probably being accepted or rejected and may be the acceptance pace may takes a very long time. The successful implementation of an innovation in education depends on teachers, who ultimately will determine how they use it in class (Albirini (2006). Teachers negative attitude towards the use of computer technology are important factors that may prevent teachers from receiving and integrating the use of computer technology in teaching and learning. The effect of such attitude, contribute to the very low usage of computer technology among teachers in most schools (Cuban, 2001; Zhao et al., 2002).

This is very serious if the LMT who is also a catalyst for change is having less confidence in attitude of using computer technology (Pelgrum, 2001), perceived that computer technology does not improve the performance of learning (Yuen and Ma, 2002) and always thought that computer technology is complicated and difficult to use (Cox et al. 1999). To ensure the successful diffusion of EduwebTV in school, LMT should be the model where they need to become a leading consumer of EduwebTV in teaching and learning, a consultant to other teachers on EduwebTV and able to convince the other teachers on the ease of use and usefulness of EduwebTV to teachers and students. In other words, the LMT need to be more innovative and confident to face the variety of educational innovations introduced as an effort to promote, persuade and convince other teachers at the school. LMT also need to be the first as an early adopters and users of innovation compared to other teachers in their schools. The question is whether the present LMT have high level of computer self-efficacy on the acceptance of EduwebTV innovation? What is the perception of the LMT toward the acceptance of EduwebTV? Do they have the confidence to use and diffuse EduwebTV to teachers and students in school?

RESEARCH OBJECTIVES

The research is to;

- Identify the level of computer self-efficacy among Library and Media Teacher (LMT)
- Know the relationship between computer self-efficacy perception of ease of use and the usefulness perceptions in acceptance of EduwebTV innovation.

RESEARCH METHODOLOGY

This research uses descriptive quantitative method. A survey technique used for this review was found appropriate to the purpose of this study that is to describe teacher self-efficacy status on innovation acceptance. This study was conducted in the existing situation without any manipulation of the subject. The population is Library and Media Teacher for the primary and secondary schools in four selected states of Kedah, Terengganu, Selangor and Johor which amounted to 3148 people. The sample was selected using a systematic random sampling technique because this technique is effective to obtain information from each of the states (Sekaran 2000). This technique is used to ensure that each state has enough representatives to be studied. Besides, this technique can control the internal validity of the sample. In this study, a total of 546 LMT have been selected to ensure sufficient data for analysis, including those who are graduates and non graduates. Data analysis is done by using descriptive analysis to obtain mean values and standard deviation. While the inferential analysis was chosen to examine the relationship that exists between the two types of variables studied.

INSTRUMENT

A set of questionnaire administered to the Library and Media Teacher. The teacher's questionnaire was used to obtain feedback on the acceptance of EduwebTV innovation and computer self-efficacy. Self-efficacy instrument was developed based on the modification of the computer self-efficacy instrument (CSE) by Compeau and Higgins (1995). The self efficacy instrument contains 16 items and represents the scale of confidence in using the innovation (10 items) and the scale of confidence in diffusion of innovation (6 items). In this instrument all the items began with the statement "I believe I can use…" This is to show that the statements items in the form of self-report about self-confidence (Murphy et al. 1989) for aspects related to the computer. Instrument on acceptance is modified from the Technology Acceptance instruments by Davis (1996), which emphasizes five main variables based on the Technology Acceptance Model (TAM) that is the perception of usefulness, perception of ease of use, attitudes toward technology, a desire to use and the actual use. In this study, researchers will examine the relationship of computer self-efficacy on perceptions of ease of use and perceptions of usefulness of EduwebTV.

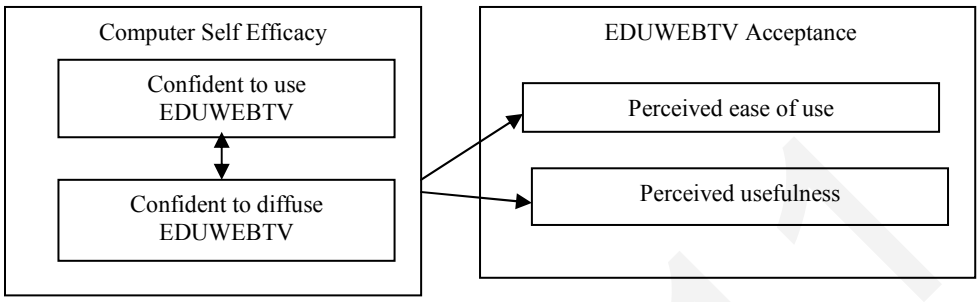
Cronbach Alfa test is used to determine the reliability index of the instrument. Cronbach Alpha value for both instruments is high. Cronbach Alfa reliability index for Computer Self Efficacy instruments is between 0.732 - 0.899. Meanwhile, the Cronbach Alpha reliability index for the instrument of acceptance is between 0.757 - 0.898. The higher Cronbach Alpha reliability index shows that the items are consistent and reliable.

Table 1: Sample of Questionnaire instrument

Area	Example of Item
Perceived ease of use	I found that it is easy to learn to use EduwebTV
Perceived usefulness	I can fulfil the task of preparing teaching and learning materials faster
Computer Self efficacy (Confident to use EduwebTV)	I believe I can use EduwebTV innovation without recommendations from friends.
Computer Self efficacy	I believe I can show my friends how to use EduwebTV

(Confident to diffuse EduwebTV)	

Figure 1: Research Model



RESEARCH FINDINGS

a. The level of computer self-efficacy of the Library and Media Teacher in the acceptance of EduwebTV innovation

Based on Table 2, a total of 166 (30.2%) LMT were at high confidence level in using EduwebTV innovation. A total of 330 LMT (60.4%) were at medium level of confidence, and only 13 LMT (9.3%) had low confidence to use EduwebTV innovation. The results showed that the mean range of confidence in using the innovation is between 3.11 and 3.36. Overall mean for the confidence in using the innovation is moderate (m = 3.27, SD = 0.67). For the confidence scale of diffusion of EduwebTV, the analysis shows that the majority of the teachers i.e. 216 persons (39.5%) have low confidence while a total of 161 teachers (29.5%) are moderately optimistic, and 169 teachers (31%) have high confidence level to diffuse the EduwebTV innovation. The range of mean for confidence scale of innovation diffusion is between 2.88 and 2.94. The overall mean for confidence scale of innovation diffusion is moderate (m = 2.88, SD = 0.62). The range of the mean for computer self-efficacy is between 2.88 and 3.36. Thus the level of computer self-efficacy among the LMT is moderate (m = 3.11, SD = 0.62). LMT is relatively more confident in using EduwebTV compared with the confidence to diffuse the innovations to others.

Table 2: Mean score, frequency and percentage of LMT computer self efficacy

	Frequency and percentage			Mean Score	Level
Scale	Mean Score >2.33 (Low)	Mean Score 2.34-3.66 (Moderate)	Mean Score < 3.66 (High)		

Efficacy of using EduwebTV innovation	13 (9.3%)	330 (60.5%)	166(30.2%)	3.27	Moderate
Efficacy of diffusing EduwebTV innovation	216 (39.5%)	161 (29.5%)	169 (31%)	2.88	Moderate
Computer self efficacy (overall)				3.11	Moderate

b. The level of acceptance in terms of the ease of use and usefulness

From the aspect of acceptance in terms of ease of use, 348 teachers (63.7%) were at high levels where they were confident that EduwebTV is not difficult to use. A total of 190 teachers (34.8%) were at the moderate level where teachers feel that it was slightly difficult to use EduwebTV. However, only about 8 teachers (1.5%) felt EduwebTV is very difficult to use. The result shows that the range of mean for acceptance scale is between 3.53 and 3.79. The overall level of acceptance of EduwebTV innovation is high (m = 3687, SD = 0.52). This shows that the majority of the LMT can accept that EduwebTV innovation is not difficult to use. The level of acceptance in terms of usefulness shows a total of 221 teachers (40.5%) were at high level of acceptance of EduwebTV innovation. This group of teachers were confident that EduwebTV is very useful and can help to simplify the process of teaching and learning. A majority of 303 teachers (55.4%) were at medium level, where teachers are not sure how EduwebTV innovation can facilitate teaching and learning. However, a total of 22 GPM (4%) had a low level of acceptance in terms of usefulness. This shows that this group is not confident that EduwebTV innovation can facilitate teaching and learning. The result shows that the range of mean of acceptance scale is between 3.40 and 3.57. Overall the level of acceptance of innovation in terms of EduwebTV usefulness is moderate (m = 3472, SD = 0.52). This shows that the LMT is less confident that the EduwebTV innovation can facilitate teaching and learning

c. Teachers' computer self-efficacy correlations between the confidence in using EduwebTV and the confidence diffusing EduwebTV

The analysis of inter-scale correlation between the scale of confidence in using the EduwebTV with the confidence of diffusing EduwebTV shows a strong correlation (r = .761, n = 546, p <0.01). This correlation is positive and significant at P < 0.01. This analysis explains that Library and Media Teacher is confidence in using EduwebTV innovation and confidence to share their knowledge and experiences about the usage of EduwebTV to another person. Therefore the confidence of using EduwebTV and the confidence to diffuse the EduwebTV can determine Library and Media Teacher level of computer self-efficacy.

Table 3: Correlation between the confidence of using and the confidence of diffusing the EduwebTV

Variable		Confidence of diffusing EduwebTV
Confidence of using EduwebTV	Pearson Correlation(r)	**0. 761**
	Significant	0.000
	N	546

d. Teachers' computer self-efficacy correlations for the acceptance of innovation in terms of EduwebTV ease of use for teaching and learning.

The findings of Pearson correlation between computer self-efficacy and the perceived ease of use of EduwebTV shows that there is a strong positive relationship among the Library and Media Teacher (r =. 511, n = 546, p <0.01). This positive relationship suggests that the population of this study feels that teacher's computer self-efficacy is important to influence the perception of EduwebTV particularly in terms of ease of use for teaching and learning

Table 4: Correlation between the computer self efficacy and the perception of ease of use of the EduwebTV

Variable		Perception of ease of use
Computer self efficacy	Pearson Correlation (r)	0.511
	Significant	0.000
	N	546

**Significant at $p < 0.01$

e. Teachers' computer self-efficacy correlations for the acceptance of innovation in terms of EduwebTV usefulness for teaching and learning.

Table 5 shows the relationship between computer self-efficacy and the perceived usefulness. Pearson correlation test showed that there was a moderate positive relationship between computer self-efficacy and the usefulness perceptions among Library and Media Teacher (r = .426, n = 546, p < 0.01). This positive relationship suggests that the population of this study believe that computer self-efficacy is important for teachers to influence the perception, particularly from the aspect EduwebTV usefulness in teaching and learning.

Jadual 5: Correlation between the teachers' computer self efficacy and the perception of usefulness of the EduwebTV

Variable		Usefulness perceived
Computer self efficacy	Pearson Correlation (r)	0.426
	Significant	0.000
	N	546

** Significant at $p < 0.01$

DISCUSSION

The results show that the overall level of self-efficacy of the LMT is average (m = 3.26), aspect of use (m = 3.27) and diffuse (m = 3.25) of the EduwebTV. This study also shows that there is a strong positive relationship between teachers' computer self-efficacy and the perceived ease of use and usefulness of the EduwebTV. This shows that teachers' computer self-efficacy is important when an innovation is introduced. This confidence can affect individual acceptances of EduwebTV as the individual will develop a perception of ease of use and usefulness of the EduwebTV. Although there are many factors that contribute to individual acceptance of technology, such as the characteristics of an innovation, individual innovativeness and encouragement individual. However, research on computer self-efficacy will give some contribution to the literature in the acceptance of technological innovation among Library and Media Teacher. The level of computer self-efficacy LMT is moderate. This means that they still feel less confident in their ability to perform the duties of users of EduwebTV and facilitators of EduwebTV for other teachers. Apart from that, computer self-efficacy has a strong positive relationship to the perception of ease of use of the EduwebTV and the perception of usefulness of the EduwebTV. This means that the higher computer self efficacy of a teacher, the more easy they accept the EduwebTV. Hence the computer self-efficacy can be regarded as the basic needs of technology acceptance as it can provide positive control of the stimulus (EduwebTV).

CONCLUSION

This research is expected to provide preliminary information of the importance of computer self-efficacy of Library and Media Teacher in Malaysia's education. It is will inject confidence to the LMT to perform as a catalyst in the process of dissemination of technological innovation to the teachers and students. To enhance self-efficacy in the present LMT, the relevant parties are to provide exposure and training from time to time, especially on the usage (ICT) and ensure that the LMT is competent users of technology. According to Bandura (1989), self-efficacy may be owned or developed through intervention programs, such as attending courses, seminars and workshops.

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COMPUTER-BASED VERSUS PEN AND PAPER EFL WRITING: A COMPARATIVE STUDY OF WRITING ASPECTS AND FINAL PRODUCT

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ABSTRACT

Although popular EFL examinations are now offering their computer-based counterparts, not all contexts have been researched yet with respect to the benefits of computer-assisted test-taking. Considering that extensive research has not yet been carried out with Greek learners it is necessary to examine the extent to which this tool can make a difference to L2 students' writing proficiency. This paper reports on a comparative, year-long study which aimed at investigating the performance of students writing on the computer against those writing with pen and paper. The participants were two groups of upper intermediate learners who would sit for popular B2 level EFL examinations. Although mixed results were yielded in relation to different aspects of writing, overall, there were statistically significant differences in the quality of writing between the two groups suggesting that the word processor can both encourage and enhance the writing process and product.

INTRODUCTION

Second language writing remained a heavily neglected skill until the early 70s when the influence of cognitive researchers in the field became prominent. Writing emerged as a complex, demanding and recursive process in need of separate attention as a skill rather than as a medium of practicing grammatical structures.

At the same period, personal computers became widely available and researchers argued that the most prominent writing tool offered, the word processor, could possibly encourage the writing process and facilitate recursiveness. Meta-analytical reviews seem to favor the role of the word processor on writing quality (Bangert-Drowns, 1991; Goldberg et. al., 2003) suggesting that writing produced on the computer is of higher quality compared to writing produced by hand. Although different studies discredited such finding favoring handwriting, the emergence of CBT has given rise to a renewed interest in the two modes of writing and the extent to which writers can benefit from each.

RATIONALE OF THE PRESENT STUDY

The present study has been motivated by a number of reasons. First, despite the abundance of research in the field, the results produced remain largely inconclusive (see Roubou, 2008). In addition, not only is research on L2 learners fairly limited compared to L1 learners, but the target group of this study (ages 13-15) has almost not been investigated at all worldwide as most studies tend to focus on academic writers. Yet, this is the target group that represents most CBT test-takers. A third reason was the need to produce context-specific research that would reflect the present situation as well as the actual needs of learners. Finally, the recent introduction of CBT testing in Greece in a way dictates the need for up to date research on this tool.

RESEARCH QUESTIONS

The following research question is addressed in this article:

1) Will the overall quality of students' writing on the computer improve more than that of students writing by hand?
   If so, what specific aspects will improve?

CONTEXT AND PARTICIPANTS

English is considered an international language and therefore adequate knowledge of the language is a prerequisite for the workplace. Although the language is taught at Greek schools, instruction remains limited and the majority of students resort to private language schools to help them master the language and obtain a qualification that proves proficiency in the language.

The participants in the study were two groups, each consisting of ten Intermediate-level or B1 level students according to the Common European Framework (CEF). Students at the B1 level typically

receive six hours of instruction per week and exposure to all four language skills. This being a comparative study, there was a handwriting (control) group and a computer (experimental) group.

PROCEDURE

The data collection lasted three school terms, which make up a whole school year. Prior to the study, the computer group received three-week training in using computers and in particular the word processor.

In the first writing class, the teacher- researcher asked both groups to handwrite the first topic so as to check if the groups were comparable in terms of writing performance. The same amount of time was allocated to both groups (1 hour) for every writing task and this remained the same throughout the year. Classes continued following the course book and from the second unit onwards until the end of the year, the computer group wrote only with the word processor. Students in the computer group moved to the computer lab to complete their tasks while the handwriting group remained in their classroom and went on with the task.

COMPOSITION SCORING

The ESL Composition Profile by Jacobs et al. (1981) was used for scoring students' compositions. This guide to composition scoring employs a holistic approach to composition evaluation, that is, readers make subjective judgments as they respond to the whole text. In its present form, the ESL profile consists of five categories, each representing an important aspect of written communication: content, organization, vocabulary, language use, and mechanics. The scores can range from a maximum of 100 to a minimum of 34. It must be noted that before compositions were marked, they were typed on the computer so that the scorer would be blind to the writing medium used and thus, it would be ensured that the grades assigned would not be affected by preconceived ideas or bias against one medium or the other.

RESULTS AND DISCUSSION

This part presents the results of the statistical analysis for students' scores for the first handwritten task and the final writing they produced, and examines whether there was improved writing quality for any the computer group as a result of using the word processor to compose. The analysis starts with the total scores which served as a basis for the comparison of overall quality between the two groups. Further analysis includes the scores produced for each aspect of the Jacobs et al. (1981) ESL composition profile: content, organization, vocabulary, language use and mechanics.

Overall quality

With reference to the comparison of writing quality, statistical analysis revealed that the computer group outperformed the handwriting group. Examining the first baseline writing task that was handwritten by both groups, the independent t-test revealed that students' differences in writing quality were far from being significant (t = -.236, p = .816).

Statistical analysis using ANOVA was carried out in order to examine whether the scores assigned for both occasions were significant for any of the two groups. Table 1 reports on the results obtained:

Table 1 Descriptive statistics and ANOVA for overall quality

	Descriptive			**Inferential**	
Effect		M	SE	F	p
prepost	Before	68.000	2.961	14.605	.001
	After	75.150	2.702		
Between Groups	Exper.	73.450	3.784	.491	.492
	Control	69.700	3.784		
Interaction (before/after & between groups)	Ebefore	67.300	4.187	7.577	.013
	Eafter	79.600	3.821		
	Cbefore	68.700	4.187		
	Cafter	70.700	3.821		

As table 1 indicates, the analysis revealed that the computer group significantly outperformed the handwriting group since the interaction including the scores of both groups for both occasions was p=.013. Considering that students in both groups produced writing of comparable quality on the first occasion, and that the instruction they received as well as the materials and the writing tasks they completed were

identical, such improvement in performance may be attributed to the effects of the word processor on the writing process.

This argument becomes stronger as it is the outcome of a longitudinal study that lasted three terms. It could be argued that this vast time span allowed students to develop their writing skills and to produce writing representative of their level of competency. Such findings parallel similar studies that found that the word processor helped students score higher and outperform the control groups writing by hand (Russell et al. 2002; Gresens, 2006).

ESL Profile aspects of writing quality

Following the examination of the total scores, this section examines which writing aspects of the ESL profile contributed to the significant difference between the two groups.

Table 2 presents the statistical data obtained through a two-way mixed ANOVA analysis for the five aspects of writing quality: content, organization, vocabulary, language use and mechanics.

Table 2 ANOVA for writing quality

Writing category:	Type of comparison:	F	p
Content:	prepost	7.845	.012
	group	.329	.574
	interaction	.872	.363
Organisation:	prepost	4.811	.042
	group	1.415	.250
	interaction	5.771	.027
Vocabulary:	prepost	15.978	.001
	group	.199	.661
	interaction	3.995	.061
Language Use	prepost	10.652	.004
	group	.471	.501
	interaction	15.610	.001
Mechanics	prepost	7.949	.011
	group	.016	.901
	interaction	1.642	.216

The data presented in table 2 start with the main effect which involves a pre and post comparison for the first and second occasion that includes all students form both the experimental and the control group. “Group” refers to a within group comparison and finally, the third statistic reported presents the interaction between both groups and both occasions. Significance for all results is interpreted mainly according to the statistics yielded by the interaction.

Content

In the first baseline writing, both groups were assigned comparable scores for content. The main effect reported in table 2 suggests that on average students in both groups improved in this aspect. Significant improvement for most students was anticipated since this was the result a longitudinal study which involved learning English and in particular, practising writing for a whole school year. Nonetheless, the interaction between the two groups and occasions revealed no significant differences for content (p= .363). This finding contradicts previous studies which discovered that students writing on the computer received higher analytic ratings in this category as they exhibited more thorough development of the content of their papers than the control groups writing on paper (Friedlander & Markel, 1990; Li & Cumming, 2001). The findings of this study seem to be more in agreement with Lam and Pennington’s (1995) study dealing with secondary school L2 learners who discovered that content was an aspect where the word processing group did not actually perform better than students writing by hand.

In the present study, lack of improvement could be attributed to the actual length of the writing tasks students were asked to perform. The instructions limited students to a maximum of 120 words and as a result, there was not enough room for great development of content. However, as this limitation applied to both groups, it seems that the word processor did not help students work more on this aspect of their compositions.

Organization

According to table 2, the pre and post comparison denotes that all students improved in organization. Similarly to content, it was expected that improvement would take place since these results reflect changes that took place over the course of a whole school year of instruction. Interpreting the interaction, we notice that the result produced is significant (p= .027). It is speculated that students used the word processor to effortlessly move from one part of their text to the other and to organize their ideas effectively and meaningfully.

This outcome is in agreement with previous studies where students using the word processor received higher analytic ratings in this category (Snyder, 1990) while it contradicts studies that have shown that the word processor gave students in the computer group no advantage in structural aspects of writing such as organization, as they failed to show improvement (Piolat, 1991). Commonly in word processing literature this finding is attributed to the fact that the small amount of text that appears on the screen at a time prevents students from attending to higher level concerns such as the organization of their texts. This issue is not pertinent to this study due to the length of the writing tasks. As already mentioned above, students were limited to 120 words per task and this amount of text could appear on the screen all at once. Therefore, the effects of screen on organization, although they may have influenced the writing process and the composition scores produced in previous research, did not constitute a variable in this study.

Vocabulary

The slightly higher ratings scores the computer group received were not statistically significant in comparison to the handwriting group as the interaction obtained was p= .061. Therefore, vocabulary was the second aspect that the word processing group failed to show improvement in. A possible reason that could account for lack of improvement is that writing took place in the lab and paralleled writing in exam situations. As a result, students in both groups were not allowed to use the resources provided by the word processor or the computer, such as dictionaries and thesauruses, or even to access similar sources of information online. The rationale behind this decision was that in this way the experimental group would not be given an advantage over the control group and thus, the comparison would be more valid.

In addition, it does not seem fair to expect that students should improve their use of vocabulary just because they compose with the word processor. This writing tool has the potential to facilitate the revising process because of the ease it offers for making changes, or even to free writers from some of the cognitive load associated with composing and allow them to attend to higher order concerns. Yet, this should not lead us to expect that the word processor on its own could help students improve their vocabulary. Many researchers have argued that it is mainly the teacher or the instruction provided that can positively influence such aspects of writing and that word processing alone cannot lead to dramatic improvement (Hunter et al., 2001).

Language Use

Language use was the second aspect of the ESL Profile in which students in the computer group showed significant improvement (p = .001). The compositions of the computer group received higher scores as they exhibited more correct and more complex uses of language elements such as tense, word order, agreement, prepositions etc. Similar results were obtained by Wallis and Howcroft (2006). Yet, what differentiates the present study is that students managed to improve their use of language without being allowed to use any of the proofing tools commonly available in such research. As all proofing tools were deactivated prior to the intervention, the automatic underlining provided by spelling and grammar-checkers, as well as the list of alternative options they provide, were not available. Deactivating all proofing tools was considered essential as the computer group should not be given an advantage over the handwriting group. Furthermore, this was in a way dictated by the specific exam-oriented context in which writing in class parallels exam situations.

In addition, the findings of this study support previous research related to revising that found that word processing encourages and facilitates surface-level editing which mainly refers to grammar (Phinney & Khouri, 1993; Li & Cumming, 2001). One of the arguments put forward in relation to this, has to do with the effects of the screen on composing. Many authors have claimed that increased focus on surface level editing can be attributed to the small amount of text that can fit on the screen encouraging students to perform local changes, often at the expense of macrostructure, global revising which involves larger parts or even the text as a whole (Pennington, 2003, p. 290). This does not refute the argument that the fact that all the text can appear on the screen at once encouraged revising the organization of texts. Rather, the fact

that students produced limited writing all of which appeared on one page, allowed them to attend both to structural aspects like organization and to surface editing as well.

It must be stressed that although macrostructure revising reflects more complex and advanced ways of revising, and has been linked to the revising processes of experienced writers (Graham & Harris, 2000; McCutchen, 2000), the importance of surface level changes should not be dismissed. Such kinds of changes may be limited to specific operations and parts of the text but still, they have the potential to improve the quality and even the comprehensibility of a text. The fact that accurate use of language can contribute to the improvement of overall quality of a piece of writing becomes evident in the findings of the present study which revealed that even though students scored significantly higher only in organization and language use, still, they were able to obtain significantly higher total scores overall. Finally, it should be stressed that investigating an EFL exam-oriented context, it would be difficult to discard the value of proper language use as it is the basic element that is always tested in all levels of English language exams.

Mechanics

Mechanics include spelling, punctuation, capitalisation, and paragraphing. Similarly to all other aspects of the profile, on average, students in both groups improved in this aspect. The interaction though suggests that no group improved significantly in mechanics than the other ($p = .216$). In order to account for this, similar arguments as with vocabulary can be raised. Since both groups received similar instruction, we should not expect the word processor on its own to help students improve in this aspect more than the comparison group. This finding contrasts with Lam and Pennington's (1995) and Kehagia's (2000) study which reported significantly higher performance for the computer group. Caution is needed though when comparing the results of other studies to the present study as proofing tools are not always deactivated for those interventions.

CONCLUSION & FUTURE RESEARCH

The word processor as a writing tool has been neglected in recent research despite exams turning into their computer-based counterparts. The results of the present study suggest that this writing tool has the potential to facilitate the writing process and enable students to produce writing of superior quality compared to writing produced by hand. In terms of future research, it would be interesting to examine the effects of the word processor on writing quality in both Greek and English and try to identify and justify similarities and differences in the results.

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COMPUTERIZING THE CANCELLATION TEST*: DESIGN, DEVELOPMENT AND VALIDATION STUDY

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ABSTRACT

Attention is a concept that refers to how we actively process specific information present in our environment. It has also been accepted as the allocation of processing resources. It is one of the main factors—age, intelligence, the general state of arousal and anxiety, motivation, psychology, physiology, environment, and the sensory system— which intervene in the learning process. Getting the attention of student to course content and sustaining this attention are considered as the important processes to make the learning occur. Therefore, the attention should be measured and the learning experiences should be organized by taking such measures into consideration. Attention as one of the basic cognitive processes can be measured by using various neuropsychological tests. Cancellation Test is one of the tests developed in this context and is used to measure the ability of sustained attention. This test was first developed by Weintraub and Mesulam (1985), and standardized for Turkish population by Karakaş and Başar (1993). The paper and pencil version of this test was conducted in many research studies, but computerized version in Turkish form has not been conducted in any study yet. This study is about the design, development and validation of computerized version of the Cancellation Test. This computerized version consists of four sub-tests (organized letters, random letters, organized shapes and random shapes) and administration panel where only researchers can access. The test was designed and developed according to universally accepted interface design principles. The test was formatively evaluated by administering to a small group of university students and was accordingly revised. The final version of the test was validated on 15 Bahçeşehir University students and the results were discussed together with the design and development processes.

Key Words: neuropsychological tests, Cancellation Test, sustained attention, computerized tests, learning

INTRODUCTION

One way the cognitive processes are used in our daily lives is with learning. Some of these cognitive processes, which play important roles in individuals' learning, are attention, perception, repetition, automation and recalling. Attention has a key role in information processing system. Attention is the mechanism by which we restrict information processing to only a small fraction of the possible amount of information. Attention includes both conscious processes and unconscious processes. There are different type of attention, such as sustained attention (vigilance), signal detection, selective attention, divided attention, and search. Sustained attention can be defined that the ability to maintain a consistent behavioral response during continuous and repetitive activity. Vigilance also refers to the ability to attend to a situation for an extended period of time.

Due to the fact that the learning materials are developed and the learning atmosphere is designed ideally according to the differences of individuals' cognitive processes, the measurement of such unobservable processes provides valuable information for teachers and cognitive psychologists who might benefit from, and the best ways for any individual to learn.

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Neuropsychological tests are used for measuring the cognitive processes that are not directly observable and explaining the behavior that results from these processes (Karakaş & Başar, 1995; Karakaş, 2006). The Cancellation Test is one of the well-known neuropsychological tests measuring the sustained attention and requiring individuals to simultaneously locate some stimuli (targets) while ignoring others (distracters). The Cancellation Test was first developed by Weintraub and Mesulam (1985) and measures the audiovisual perception, searching, sustained attention and reaction time (Karakaş and Kafadar, 1999). Cancellation Test consists of four A4 sized sub-tests that are composed of organized and random letters, and organized and random shapes. There are some necessary materials for administration: Four recording sheets, four answer sheets, two sample cards including target letter and shape, at least six colored pencils with different colors, an eraser; scotch tape, and a stopwatch (Karakaş, 2004).

There are 60 target stimuli in each sub-test. The targets located on the each quarter of the page with an order that there will be 15 ones in each part. The target stimuli for organized and random letter sub-test is letter 'A', on the other hand a shape look like a sun (see Figure 1) is target stimuli for organized and random shapes sub-test (Karakaş, 2004). The targets are distributed in a special order and scattered randomly in organized and random sub-tests respectively, but their locations remain the same in each sub-test (Kılıç et al., 2002).

Figure 1. The target stimulus for random and organized shapes sub-test.

A sample card is used before a person passes from one sub-test to another sub-test of the Cancellation Test. The original forms are not used for sampling of the target. During administration, the forms should be fixed on the tables according to the participant's view. The color of the pencil must be changed in each 10th cancellation for both letters and shapes. The stopwatch starts at the beginning of the test and stops when the participant finishes all the forms; then this time period is recorded. The highest score is 60 for *Number of Correct Target Detection* for each sub-test. The time of administration is approximately 20 minutes (Karakaş, 2004).

The paper-pencil version of Cancellation Test has been used in many studies (e.g. Bailey, Riddoch & Crome, 2004; Byrd et al., 2004; Laurent-Vannier et al., 2006). This test was translated and standardized into Turkish by Başar and Karakaş (1993). The standardization project was done on adult population by Karakaş, Eski & Başar (1996). The nine months test-retest reliability analysis showed that the reliability coefficients were .80 - .81 for Total Time for Completing scores, were .32 -. 57 for Number of Correct Target Detection, Number of Omission Errors, Number of Commission Errors, and Number of Total Errors scores *(*Karakaş, Eski & Başar, 1996). The Turkish adult form was used in different studies (e.g. Cantez et al., 1996; Çağlar & Koruç, 2006; Karakaş, Eski & Başar, 1996; Karakaş & Kafadar, 1999; Kılıç et al., 2002; Küçük et al., 2009). Results of these studies were support psychometric properties of the test. Also, Children *version of* Cancellation Test was completed by Kılıç et al (2002). The test-retest time interval was two months. Results showed that reliability coefficients were .45 - .83 for all sub-tests. As a results these two projects indicated that both adult and children version of the Cancellation Test has acceptable psychometric skills for Turkish culture.

Given computers' increasing influence demands for data collection, researchers and educators are being asked to utilize them in psychological measurement and data collection. Computerized data collection systems offer eight key benefits relative to traditional, time-consuming paper-and-pencil methods: (1) less missing data, (2) accurate data recording, (3) more timely transmission of data, (4) less need for post-collection editing and coding, (5) immediate and objective feedback, (6) less use of test materials, (8) easy management and grading, and (7) ongoing monitoring of data quality (Barak & English, 2002; Cernich et al., 2007; Hadwin, Winne & Nesbit, 2005; Huang & Wang, 2005; Lichtenberger, 2006; Mandell & Sackett, 2008; Paul et al., 2005).

Regarding such benefits, some neuropsychological tests-Chinese version of Cancellation Task (Wang, Huang, & Huang, 2006), Line Orientation Test and Enhanced Cued Recall Test (Aşkar et al., 2010) are computerized

as well. The aim of this study was to develop a computerized version of the Turkish version of Cancellation Test. In this context, the design, development and formative evaluation of computerizing process were also discussed.

METHOD

Instrumentation

1. Development of The Software
1.1 Visual Conception

The computerized test has main screens: Instructions, sub-tests and results.

1.1.1 Introduction

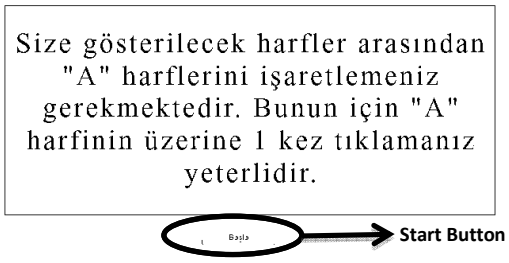

Figure 2. Instruction Screen

In this part, general information about the planned operation is given to the participant. There is a button to start test for the participant just under the instruction (see Figure 2).

1.1.2 Sub-Tests

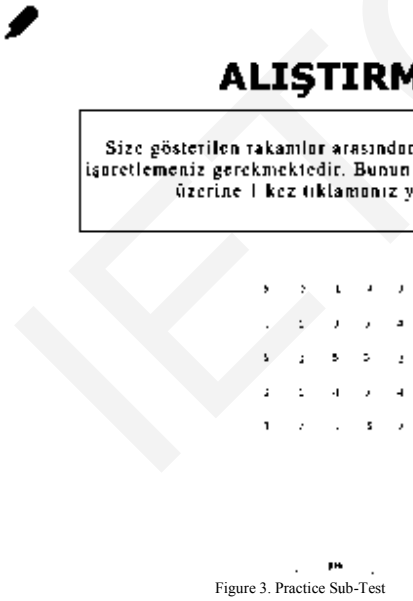

Figure 3. Practice Sub-Test

There are 5 Cancellation Test sub-tests one of which is the example for practice. In the practice sub-test (see Figure 3), characters different from the original sub-tests are used. The aim of this sub-test is to introduce the system to the participant and explain the planned operation clearly.

The other four sub-tests (see Figure 4) are the main sub-tests of the Cancellation Test and each of these is designed exactly the same as the original traditional version. Shapes and the letters are created one by one by

the help of the Flash program's drawing tools and components; and located on the screen regarding the original location in paper and pencil version. There are eight pencils with different colors at the top of the forms, which are used by the participant during the test.

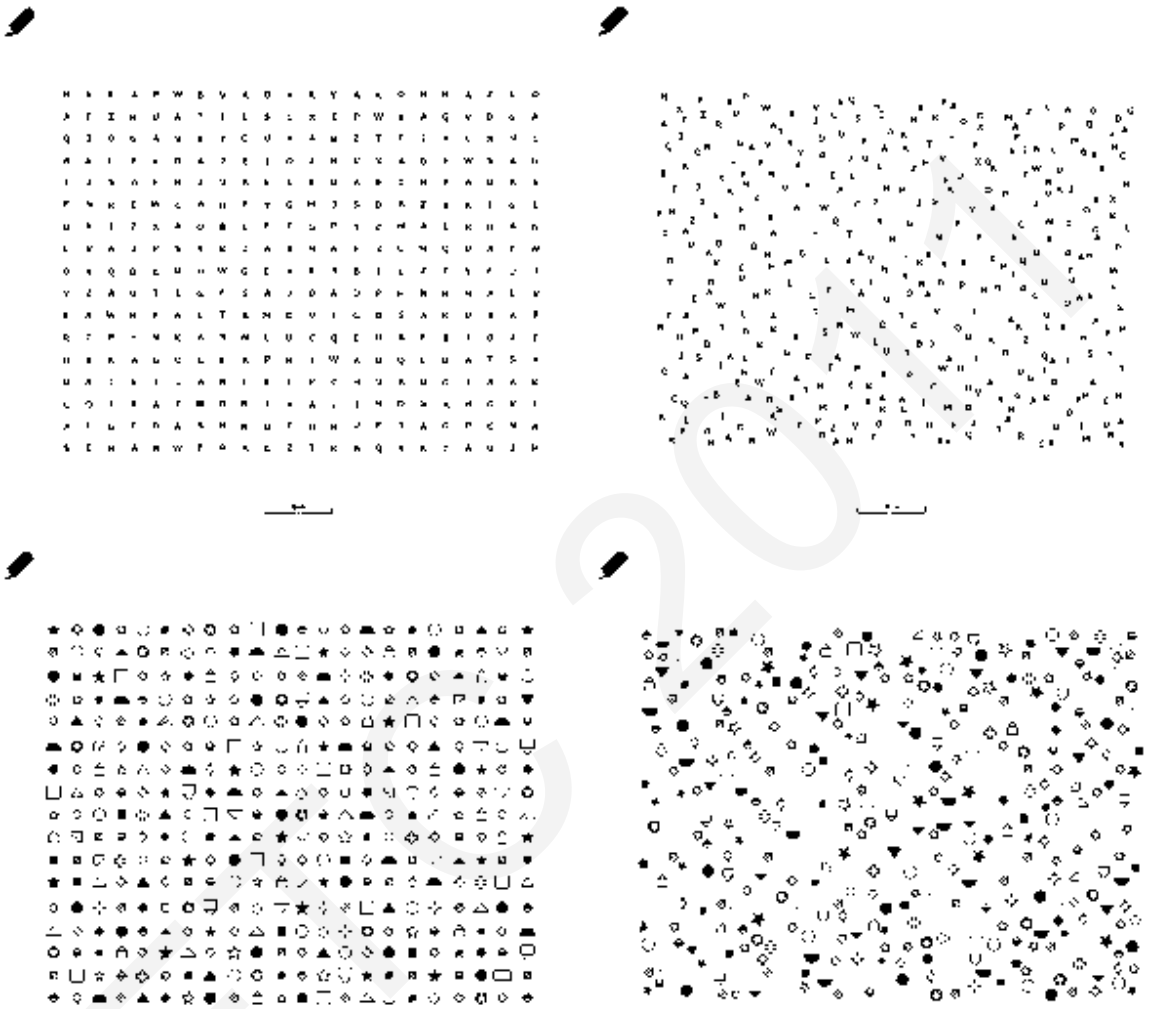

Figure 4. Sub-Tests: Organized Letters, Random Letters, Organized Shapes And Random Shapes

1.1.3 Results

In this screen, the results in tabular form for all participants are displayed (see Figure 5). The following information is given in this table for the each sub-test: Total Time for Completing in milliseconds, Number of Correct Target Detection, Number of Commission Errors and the image of the completed test for each participant with their nicknames. The completed images of each sub-test done by the participants can be reached via the "Göster" button here. The table header contains the total number of participants together with the three buttons having functions: Printing the whole table, starting a new practice, and exiting from the Computerized Cancellation Test (see Figure 6).

Ad	Test 1				Test 2				Test 3				Test 4			
	Doğru	Yanlış	Süre	Resim	Doğru	Yanlış	Süre	Resim	Doğru	Yanlış	Süre	Resim	Doğru	Yanlış	Süre	Resim
buku_02.05.2011	59	0	77.967	Göster	59	0	83.296	Göster	59	1	76.611	Göster	60	1	77.483	Göster
negu_02.05.2011	60	0	123.036	Göster	59	1	137.535	Göster	60	0	94.456	Göster	60	0	186.316	Göster
nigo_0205	58	0	78.725	Göster	60	0	86.935	Göster	58	0	81.765	Göster	60	0	73.618	Göster
gude_0205	60	2	90.743	Göster	58	0	92.338	Göster	60	1	86.82	Göster	60	0	71.149	Göster

Figure 5. Results Screen

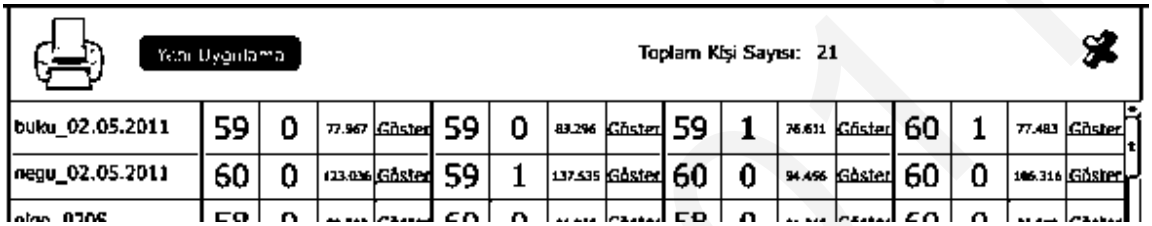

Figure 6. The Menu of Results Screen

1.2 Encoding of The Computerized Version

1.2.1 The platform

The Cancellation Test was designed and coded in Adobe Flash CS5 platform with Action Script 3.0 (AS3). The Flash applications are the ones, which provide for mixing the coding and visuals, and can run on every operating system.

Procedure

The developed test was put into practice to the participants one by one in a laboratory. And while the participants answered the questions of the test in a testing proof room, their monitors were analyzed.

1.2.2 The Operations

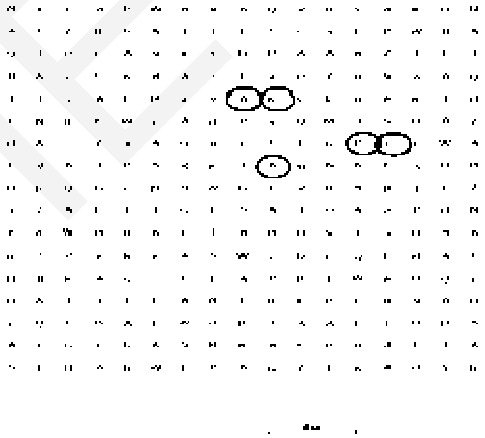

Figure 7. Circled Targets

The test starts when the participant clicks the button just under the instruction. The expected action by the participant is to click on the correct target. When the participant clicks any target, it will be circled. There is no feedback to show that the participant has made a commission error (see Figure 7).

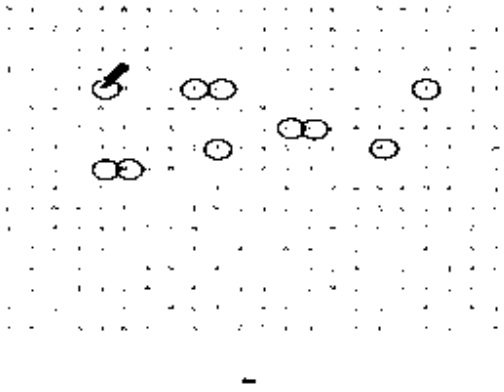

Figure 8. Pencil Changing

After each 10th cancellation, the pencil color changes. The following pencil comes to the place where cursor has been (see Figure 8) and the participant must click on this pencil to continue to the cancellation, which makes participant feel the reality of the test in virtual atmosphere.

Because the participant can do up to 20 commission error, there are 8 pencils.

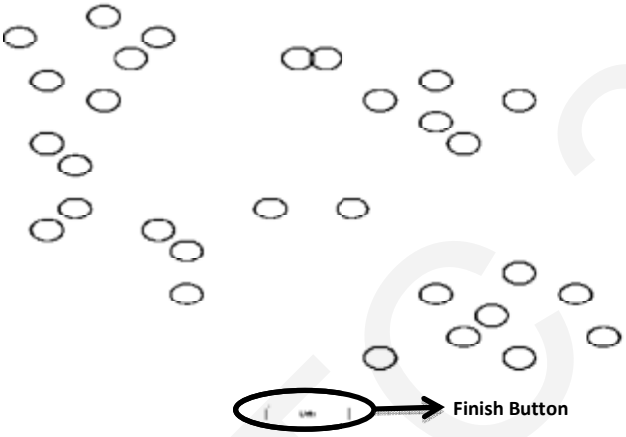

Figure 9. The End of The Sub-Test

The test continues until the participant clicks the finishing button just under the form (see Figure 9).

Research Participants

The studying group was 15 volunteer students from Department of Computer Education and Instructional Technology, Faculty of Arts and Science of Bahçeşehir University. Their age range is 18 – 25. The tests were administered to these 15 students. For the anonymity purposes, different nicknames were assigned to each user.

RESULTS

In this study, the all four sub-tests of the Cancellation Test were computerized. The Computerized version of the test has more advantages than the paper-pencil one. It can make accurate and faultless measurement and it provides time saving because it can put into practice to lots of participants at lesser time. For instance total administration time for computerized version is approximately 10 minutes. On the other hand, as mentioned above this administration time is 20 minutes for paper pencil version. Finally the other advantage is that it provides to show the simulators and audiovisual animations. Because of these all advantages, it is considered that computerization of neuropsychological tests will be useful.

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Creating an Enjoyable English Learning Environment via Interaction with a Teaching Assistant Robot

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Abstract

This paper proposes a design for a cutting-edge English program in which learners of English in elementary school English classes have lively interactions with a teaching assistant robot, thus integrating the idea of learning with technology (including computer assisting teaching, digital learning, and internet instruction) with functionality of an intelligent robot. The goals of this study are to increase the students' motivation to study English through the development of a human-robot interactive English program, and in doing so, to elevate the four English skills of the students -- speaking, listening, reading and writing by (1) adopting a vivid, enjoyable teaching approach; (2) creating practical, interesting learning materials; and (3) promoting a natural, enjoyable learning context. This paper provides a set of guidelines and directions that other researchers can use to create an innovative and enjoyable English classroom that employs an interactive robot as an assistant for the purpose of building a solid foundation for future English acquisition while reducing the pressure and teaching load of the English instructors.

Keywords: teaching assistant robot, Communicative Language Teaching, Storytelling Approach, interactive English leaning environment

Introduction

The English curriculum in elementary school emphasizes building a natural and enjoyable language learning environment in order to raise student learning motivation and basic communication ability. The ideal teaching strategy is implemented by (1) adopting vivid, enjoyable teaching approaches; (2) creating practical, interesting learning materials; and (3) promoting a natural, enjoyable learning context. Shi & Zhu (1999) also pointed out that English teaching in Taiwan's elementary schools should create an authentic and natural English learning environment, enhance understanding of local and international cultures, raise the student's learning motivation, and assist the student to develop basic English communicative skills. Teaching methodologies should employ lively classroom activities and authentic teaching materials should be used to stress varied, practical, real-life subjects. However, traditional teaching methods, such as rote memorization, cramming for examinations, and grammar translation methodologies cannot address the optimum curriculum design requirements for language learning in elementary schools. On the other hand, new learning and teaching systems like Robot-Learning and r-Learning provide the opportunity for revolutionary English teaching methodologies. Today, an intelligent robot can be programmed as a teaching assistant, making r-Learning a valuable new classroom resource for English learning in the classroom. The teaching assistant robot employed in this study integrated modern technology learning

methods including Computer Assisted Instruction (Computer-Aided Instruction), e-learning (e-Learning), and online teaching (Web-Based Instruction) to provide r-Learning functionality, provided an irreplaceable 3D visual experience, and engaged students as a result of its novel appearance, (Han and Kim, 2009). Therefore, the advantages and special characteristics of the teaching assistant robot enabled the teachers to achieve highly effective language teaching. The upper part of the robot employed in this study was android in nature, with a head, face, ears, and arms, whereas the lower part of the robot was wheeled, to make it easily mobile. The upper part of the body was able to imitate all kinds of human actions as well as perform a variety of teaching activities. The teaching curriculum embedded in the robot interface database was designed by the researchers in accordance with Taiwan's *Scheme for Grade One through Grade Nine curriculum* and was designed to mesh with the text books previously adopted by the elementary school. The English instructors, Communicative Learning Theory (CLT) and Storytelling Approach were all resources and concepts applied to the design of the teaching database and lesson plans. Fifty students in one elementary school in Yunlin County (Taiwan) were selected to participate in this study as the experimental group and interact with the teaching assistant robot. Quantitative evaluation was adopted as the methodology to be applied to data analysis in order to measure the effectiveness of this English program. The experimental results showed that teachers and students all found the robotic assistant teaching technique to be effective. The researchers hope that the findings of this study will enable them to produce a commercialized version of the teaching assistant robot in quantity in partnership with industry in order to advance the development of the robots in Taiwan, an art which is still in its infant stage.

Literature review

Research into robot assisted teaching is still in its initial stages and more and more researchers are joining in the exploration of this field. Japan and South Korea are the most active countries, at present, in researching educational robotics. The current international research status of robot-assisted language teaching is described as follows.

In recent years, many researchers have applied the principles of robotics to education (Klassner, 2002; Ryuey et al., 2008; Weinberg and Yu, 2003). However, only a few researchers have focused their attention on implementations of robotics by which "the robot is applied to language teaching in elementary schools", (Chang et al., 2010). For example, the Korea Institute of Science and Technology (KIST) developed the English teacher robots "Inky" and "Mero" which attracted much attention from the New York Times, CNN, and Time magazine (TIME). "Inky" and "Mero" were listed as being among the 2010 world's best 50 inventions by Time magazine on November 11, 2010. "Inky" and "Mero" were a new implementation of r-Learning, (Korea.net website, 2010) and continue to be used as language teaching assistant robots and assistant teachers for English teaching in Korean elementary schools. The experimental results have demonstrated that the oral ability of students using "Inky" and "Mero" shows significant progress, (Lee et al., 2010). Meanwhile, Chang et al. (2010) have proposed five kinds of teaching programs which employ

their “Spencer” humanoid robot in elementary school settings as a second language tutor. The humanoid robot "Robovie", with communication and interaction ability, has also been applied to elementary school settings as a foreign language tutor and learning partner, and the experimental results have received positive affirmations, (Kanda & Ishiguro, 2005). Hur & Han (2009) have verified that teaching assistant robots can be considered an effective tool for language education, and that robots can improve English teaching effectiveness through an interactive storytelling methodology.

Chang et al. (2010) proposed seven features defining an ideal Teaching Assistant Robot – repeatability, flexibility, digitization, humanoid appearance, body movement, interaction, and anthropomorphism. Anthropomorphic robots have been found to be the most popular and appropriate design for teaching assistant robots, whereas zoomorphic robots are the second most popular design and are particularly well suited for students in elementary school students (Ryu et al., 2006, 2007). Goetz et al. (2003) also pointed out that humanlike robots are more suitable for service and social contexts, as opposed to machinelike robots. Humanoid robots designed to assist teaching must be provided with listening and speaking capabilities (Shih et al., 2007) and such humanoid educational robots promote user engagement and enjoyment of learning (Xie et al., 2008).

Research Methods

The following teaching theorems and teaching assistant robot design strategies were employed in this study:

Language Teaching Theorem

The teaching database development of the teaching assistant robot in this study was based on the following theories: Communicative Language Teaching (CLT), Teaching Storytelling, and the Total Physical Response (TPR) Teaching Method.

Communicative Language Teaching

The teaching purpose of CLT is to enhance the learner's communication ability (Savignon, 2001), that is, the goal of learning a second language is to enable the learner to use the target language to engage in meaningful communication. Instruction on grammar, pronunciation, and vocabulary are only used to empower learners to conduct meaningful communication and to understand real life documents. CLT can motivate the learners to improve their speaking and writing skills in the following ways--(1) exploring the meaning of such documents and interactions on their own as a result of their language learning, (2) deciding on their own what their practical knowledge requirements are, and (3) successfully using the language for the desired communicative purpose. In contrast, traditional learning methodologies focus on increasing reading and listening skills by the mechanism of learning only that information specifically selected by the teachers (Savignon, 2001).

Teaching Storytelling

Egan (1986) proposed an assessment model of objectives-content-methods which encouraged teachers to think of teaching their English courses and delivering lectures to their to the students as storytelling. The American English Teachers' Committee (AETC) defines the storytelling method as an approach in which the content of the course is a narrative which is conveyed to the audience through voice and action. Storytelling includes "Story + Tell + ing", that is the story, presentation, and interaction (Ryan, 2004). Hur & Han (2009) propose a storytelling method which uses digital technology to deliver the story and their digital storytelling methodology integrates film, video, music, narrative, and voice. Profound dimensions and vivid colors are employed in the roles, situations, and experiences of the story.

Total Physical Response

The TPR teaching method is suitable for students just beginning to study English at the elementary school level and can enhance the student's interest in learning through saying and reacting or learning language through physical activities, (Asher, 1982). Asher (1982) also stressed that the TPR approach uses full body reactions with computer game-like body movements while learning the language such that learners are able to effectively reduce nervousness and pressure and thus enhance learning.

The researchers were cognizant of the above conceptual framework as they developed the teaching database for the teaching assistant robot used in this study, (1) The TPR approach was applied in databases of English character teaching, making use of entertaining body movements, singing, and dancing in order to help students internalize their lessons, (2) The CLT approach was used in the development of databases for the teaching of self-introduction, conversation teaching, and teaching via storytelling, (3) The storytelling approach was used in preparation of the database for teaching via storytelling.

Design of Method of Teaching Assistant Robot

Hardware Design

The physical design of the teaching assistant robot was based on the need for an external appearance that was human-like or cartoon-like robots, with the following specific criteria: (1) The appearance of the robot must be appealing and interesting in order to attract the attention of children; therefore, the researchers chose a humanoid structure with various cartoon-like elements appropriate to the needs of the curriculum (see Figure 1); (2) A 7" touch-panel needed to be set on the robot's chest to show multimedia teaching content and to interact with students such that it would increase the students' attention and motivation; (3) The upper part of the robot needed to imitate all kinds of human actions as well as perform a variety of teaching activities; (4) The robotic hands with cupules needed to easily hold teaching materials and English character cards to enhance the concentration of students; and (5) The price of this robot, should it reach commercial production, needed to be reasonable for general classroom and family use.

Figure 1 Teaching assistant robot

Robotic Teaching Databases Design

Robotic teaching databases were designed to be congruent with the English curriculum content of the classes attended by students in the experimental group, as well as the need for an enjoyable learning environment in elementary school, opinions of teachers, the capabilities of the robot, as designed, and the three teaching theories. Details of the databases were as follows:

1. English characters teaching--The teaching assistant robot was designed for use by beginning English learners in elementary school. The 26 English letters were included first in the robotic teaching databases to enhance student ability to internalize the listening, speaking, reading and writing of English characters. The robot was able to repeat the correct pronunciation of the 26 letters (in the voices of men, women, and children) and display the related word cards to students. The screen incorporated in the front of the robot displayed the correct way to write the letters and the robots then sang the vocabulary words while dancing with the students to allow the students to learn kinesthetically. The English letters, words, songs, and dance motions were all components of the robot's database.
2. Self-introduction teaching--The robot was able to use simple English and Chinese sentences with playful and lively actions to introduce itself to the students, and those sentences were also displayed on the touch-panel at the same time. Next, students introduced themselves, their families, and friends to the robot, with assistance from the teacher.
3. Body movement teaching--The robot pointed at various parts of its body, said the English words, and displayed words for body parts on the touch-panel, so that students could relate the words to their own bodies. The database also incorporated dances and aerobics for instruction on the body parts.
4. Conversation teaching-- Lee et al. (2010) pointed out that when a teaching assistant robot is used in English teaching it help students to improve speaking ability. In this study, the robot also had instruction of English conversation incorporated into its database.
5. Storytelling teaching –The visual appearance of the robot was designed in accordance with the protagonist of the story. The robot played the various characters in the story by using different

voices. The robotic storytelling achieved the most dramatic presentation by using various role voices, plentiful music, multimedia background, and subtitles to attract the attention of students, such that students fully engaged in the story and got maximum learning effect.

Experimental Results

The teaching assistant robot was used to enrich English courses in the third and fourth grade classes (a total of 50 students) of Huwei elementary school of Yunlin County, Taiwan in Oct., 2010. Five robotic teaching sessions of about 50 minutes each were given to students. The actual implementation of robot teaching assistant is shown in figure 2.

Figure 2 Real teaching implementation of the teaching assistant robot

After the courses, a simple questionnaire was administered to students and teachers. The survey showed that the students' assessment was very positive with the majority of students indicating that they believed that robot assistant teaching could enhance their motivation to learn English, they were satisfied the interactive functionality and the user interface of the robot, and they also said they would be willing to use robots again as teaching assistants in the future. Teacher assessments are also very positive for the teaching assistant robot. Two teachers indicated that the robot could really give them positive help and share the pressure of teaching English and they said they wanted to use the robot as their teaching assistant again in the future. The operation and interface of the robot was very simply and friendly, they said, but they perceived a need to further strengthen the teaching content. The data collected from the teachers and students, respectively, showed that the acceptance of the robot was very high for both of teachers and students. The operational functioning and teaching effectiveness of the robot was satisfactory to the teachers, but they perceived a need for further strengthening of the teaching content in the databases of the robot.

Acknowledgment

This research was partially supported by the National Science Council in Taiwan through Grant NSC 99-2628-E-150-046.

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CRITICAL REVIEW: THE MODEL FOR DISTANCE EDUCATION MANAGEMENT AND ADMINISTRATION

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Abstract

In contemporary world, developments in technological field caused the emergence of new instruments and techniques in the fields of education and teaching. With the use of some general purpose technologies primarily internet in the field of education, distance education method emerged, which developed rapidly. In this framework, the concept of distance education, the functions of distance education management and administration in higher education become hot issue in academic agenda. Significantly, the practice of distance education and how it could be effective in management and administration aspect beside the pedagogical implications needs to be discussed and further solutions need to be set.

Key words: administration, distance education, model, pedagogy

Introduction

In the current age we live in, technology has become an important component. Every day there is some new gadget or software that makes lives easier and improves on the technology and software that already exists. Making lives easier is not, however, the only role technology plays in our lives. With these improvement distance education applications has become vital part for the information society.

Distance education, has been defined a number of different ways in the literature. Generally, when the definitions of distance education are examined, five specialties of distance education reveal. In this respect, distance education can be defined as both instructors and learners stand at different places during learning process, influence of an educational organization, use of media to link teacher and learner like video, audio, and computer, two way exchange of communication, learners as individuals rather than grouped, educators as an industrialized form.

Distance education has traditionally been defined as instruction through print or electronic communications media to persons engaged in planned learning in a place or time different from that of the instructor or instructors. The traditional definition of distance education is slowly being eroded as new technological developments challenge educators to reconceptualize the idea of schooling and lifelong learning.

At the same time, interest in the unlimited possibilities of individualized distance learning is growing with the development of each new communication technology. Although educational technologists agree that it is the systematic design of instruction which should drive the development of distance learning, the rapid development of computer related technologies has captured the interest of the public and has been responsible for much of the limelight in which distance educators currently find themselves. Although the United States has seen rapid growth in the use of technology for distance education, much of the pioneering work has been done abroad (Keegan, 1996).

Distance education has gained a permanent, highly visible place in the worldwide higher education community. A practice that a few years ago held only a niche role now is an indispensable element of many institutions' curricula, success, and overall reputation. From working adult learners to full-time students living on and off campus to dedicated educators, individuals are increasingly taking advantage of synchronous distance education opportunities such as virtual lectures and mentoring, as well as asynchronous distance learning offerings such as digital online courses, flexible content creation and distribution, and built-in assessment tools (Meyer, 2002).

Considering distance education applications with its pedagogical structure and implications is not enough to drive quality and reputation in higher education. Therefore, there is a potential need for in-depth investigation and attention how

pedagogical models and implications foster organizational knowledge and development (Aksal A, 2009; Gazi A, 2009).

Method

This paper stands on general literature review in the field of distance education. In this respect, documentary analysis was applied to reveal the importance arguments for the research focus. In addition to this, the paper proposes a model and view points for the distance education applications as regards the literature.

Critical reflection from the literature

With a growing acceptance of distance education and widespread technology integration, almost all higher education institutions face particular challenges such as technological, organizational, pedagogical, and cultural, etc. to delegate institutions adapt to current changes (Hawkins, 2001; Khaktar, 2001; Oblinger, Barone, 2001). According to Khan (2001), new developments in learning provides opportunities to create well-designed, learner-centered, engaging, interactive, affordable, efficient, easily accessible, flexible, meaningful, distributed, facilitating distance education environments and designing distance education requires thoughtful analysis and investigation of how to use the internet's potential. In addition, Salmon (2002) put forward to the learning platform of distance education as it is flexible, learner centered and disciplined to enhance skills of the learners within a framework of life long learning philosophy. Although Salmon (2002) derived successful model to the pedagogical aspect of the distance education applications, McPherson and Nunnes (2006) filled the gap on the necessity of considering management and administration in online context. However, all these contributions stay partial because of not reflecting harmony about pedagogy and management in distance education based on empirical evidence (Aksal A, 2010; Gazi A, 2010). In this respect, here is the proposed model to consider both pedagogy and management. In following, figure 1 was drawn based on the harmony of distance education pedagogy and management in respect to Salmon (2002) and Khan (2001).

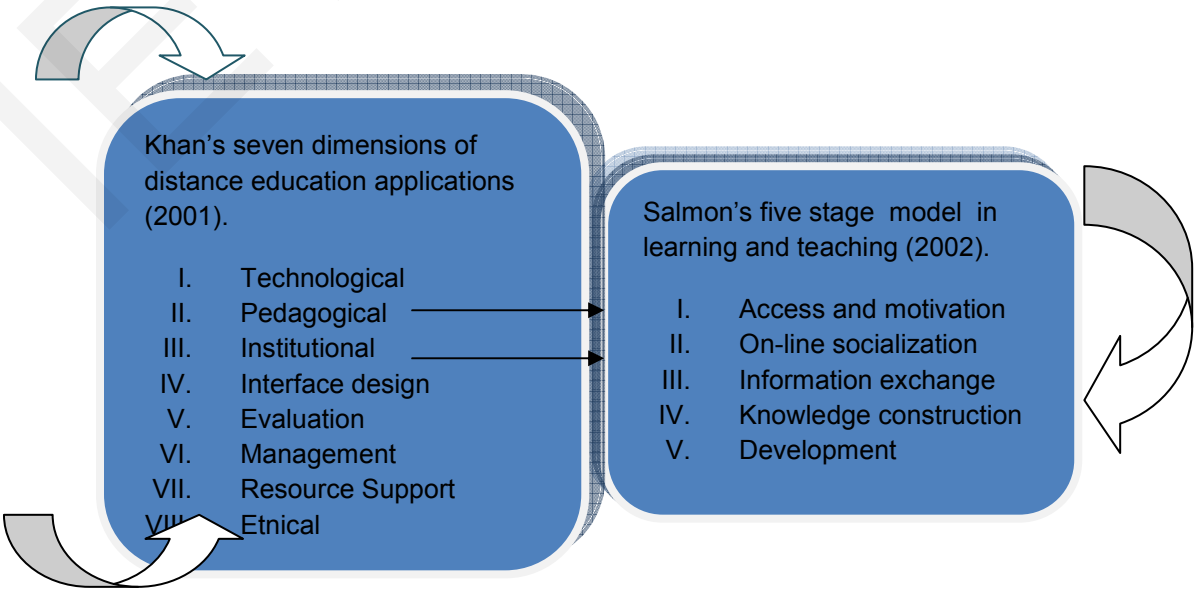

Figure 1. Two view points to distance education applications

Khan (2001) proposed eight dimensions and sub-dimensions of the distance education which are technological, pedagogical, institutional, interface design, evaluation, management, resource support and ethical aspects for qualified distance education practices.

The institutional dimension is concerned with issues of administrative affairs (e.g., organization and change, accreditation, budgeting, and return on investment, information technology service admissions, graduation, and alumni affairs); academic affairs (e.g. faculty and staff support, instructional affairs, workload, class size, compensation, and intellectual property rights); and student services (e.g., pre-enrollment services, course and program information, orientation, advising, counseling, financial aid, registration and payment, library support, bookstore, social support network, tutorial services, internship and employment services, and other services) related to distance learning.

The pedagogical dimension of distance education refers to teaching and learning. This dimension addresses issues concerning goals/objectives, content, design approach, organization, methods and strategies, and medium of distance education environments. Various distance education methods and strategies include presentation, demonstration, drill and practice, tutorials, games, story telling, simulations, role-playing, discussion, interaction, modeling, facilitation, collaboration, debate, field trips, apprenticeship, case studies, generative development, and motivation based on constructivist approach.

The technological dimension of the framework examines issues of technology infrastructure in distance education environments. This includes infrastructure planning, hardware, and software. The interface design refers to the overall look and feel of distance education programs. Interface design dimension encompasses page site design, content design, navigation, and usability testing. The evaluation for distance education includes both assessment of learners and evaluation of the instruction and learning environment. The management of distance education refers to the maintenance of learning environment and distribution of information. Further to this, the resource support dimension of the framework examines the online support (e.g., instructional/counseling support, technical support, career counseling services, other online support services) and resources (i.e., both online and offline) required to foster meaningful learning environments. Significantly, the ethical aspect is related to social and cultural diversity, bias, geographical diversity, learner diversity, information accessibility, etiquette, and the legal issues (e.g., policy and guidelines, privacy, plagiarism, copyright).

Khan (2001) put forward to think overall compontents of the distance education applications in order to have quality and development in this platform. Further to this, Salmon (2002) provided an argument how learning and teaching in terms of pedagogical aspect of distance education applications can be effective based on five stage model. The five stage model of Salmon (2002) have been practiced in higher

education institutions to enhance teaching and learning process which covers access and motivation, on-line socialization, information exchange, knowledge construction and development. Salmon (2002) supported the argument that Khan (2001) underlined, there is intensified need for technical ability and infrasturacture, institutional support to foster qualified teaching for meaningful learning. At this point, here is the new argument can be raised that Five Stage Model of Salmon (2002) can be also productive for management and adminsitration aspect of distance education to create organisational knowledge and development based on participative management and team work culture. Therefore, it is highly intensified to feed administrative and institutional practices with this model beside the pedagogical practices. In addition to this, while considering this model within administration and organisational knowledge, there is also significant to consider the dimensions of distance education applications as Khan (2001) proposed. In this respect, two view points for distance education applications can be proposed for higher education institutions while constructing or reconstructing their distance education applications. In summary, these two view points are: 1. Integrating Five Stage Model of Salmon (2002) into institutional development process 2. Considering dimensions of distance education applications as Khan (2001) stated while teaching and learning online. These two view points may help enhancing the quality in distance education not only for learning and teaching process, also for the intercconected bond with the administration.

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CS 101 CONSIDERED HARMFUL: PEDAGOGICAL TECHNIQUES FOR ENLIVENING A REQUIRED COURSE IN COMPUTER SCIENCE

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ABSTRACT

Faculty teaching a computer science courses that is a graduation requirement for all students face the twin obstacles of the affective indifference and the intellectual complacency of students. The indifference is a consequence of its nature as a required course. The complacency derives from the students' perception that they already know the subject matter. The result is a course that is endured not embraced. The empirical studies presented here, however, suggest that these obstacles can be overcome. Indifference is countered by physical and cognitive engagement, and complacency is combated by extending the reach of the subject matter beyond the givens of the textbook and laboratory manual. Especially important is the centrality of problem solving. Examples of classroom exercises and assignments illustrate the innovative elements of the course, and rudimentary statistical assessments demonstrate the effectiveness of those innovations.

INTRODUCTION

A preponderance of colleges and universities in the United States require that all students, irrespective of their major, complete at least one course in computer science. Students pursuing scientific or technical degrees, such as computer science, mathematics, or biology, most typically complete a course in computer programming that includes an introduction to data structures. Other students complete a less technically rigorous course that combines some programming and computer applications, a brief history of computing, major terminology and concepts, and ethical issues. This latter course, generically referred to as CS 101, poses such problems for faculty and students alike that it can be considered harmful. The harm, however, can be mitigated by innovative teaching that leverages student involvement, both cognitive and physical, with problem solving.

COURSE DESCRIPTION

The specific instance of CS 101 dealt with in this paper is offered at Iona College, New Rochelle, NY. Iona is a private, historically Roman Catholic institution that draws a majority of its approximately 3,000 undergraduates from the greater metropolitan area of New York City. The official title of the course is Computers, Technology, and Society, and it has six enumerated learning objectives. By the end of the course students will:

(1) understand the components of a computer system and its functions;
(2) understand the software development and the problem solving process;
(3) understand the social and ethical issues engendered by computers;
(4) understand computer terminology and the technology of the computer age;
(5) envision the future use of the computer in the student's career;
(6) understand how this foundation can lead to more advanced courses in computer science.

These learning goals are measured by a survey administered to faculty and to students. The student survey is administered anonymously. The objectives are achieved primarily though teaching spreadsheets using MS Excel, databases using MS Access, Web page design with HTML, and programming using Python, each of which is encapsulated within individual instructional modules. The mode of instructional delivery is two lecture periods and one laboratory period, each of an hour, per week for sixteen weeks.

THE PROBLEM

CS 101, as are many required courses, is not popular because it is a graduation requirement, and it is especially plagued by affective indifference and intellectual complacency. Students enter the course thinking that their level of computer familiarity nullifies the value of the course. For students conversant with Facebook, Twitter, and text messaging, the course, often uncomfortably, moves students from using the computer as an appliance to using it as a tool for inquiry.

PHYSICAL MOVEMENT

Indifference is countered by physical and cognitive engagement, and the complacency is countered by extending the reach of the subject matter beyond the textbook and laboratory manual to emphasize current developments. Evidence indicates that emphasizing student participation in the class can have a positive effect on student commitment to excellence and appreciation of other students' contributions to the learning experience (McCurran, 2006). Computer science is an especially apt place for physical engagement because physical movement underlies all computer operations, so a key component of revitalizing the course is to engage the students in physical movement. Physical movement divides into two categories, geographical relocation and dramatic enactment. This entails, for example, dividing the class into groups of four or five and having the groups meet outside the class to work on a problem. The more innovative and engaging type of physical movement is dramatic enactment. To teach the relative efficiency of two sorting algorithms—for instance, bubble sort and selection sort—the classroom becomes the computer, some students become the data, some the controller, and others the arithmetic-logic unit. The sorting of, say, six integers is physically enacted and then discussed. Six chairs are numbered zero through six, and six students hold pieces of paper with single digit. The students sit in the chairs randomly, and another student has them stand up, move around, and then sit down again in accordance with the sort algorithms. The other students record the actions. The division of labor allows introverts and extroverts to play roles calibrated to their personalities. In dramatizing the two algorithms, it becomes clear to students how inefficient bubble sort is. The difference is more sharply realized than in a chalk and talk or MS Powerpoint presentation because the students become the algorithms. A similar enactment is used to teach adding two integers on the assembly-language level, which dramatically illustrates that addition is not an atomic operation.

An innovation related to physical movement is that of the discovery day. Twice during the semester, students are given an assignment that must be completed within twenty-four hours. A regularly scheduled class is canceled, but the instructor shows up to answer questions and is readily available in person and electronically during the period. The goal of the discovery days is to force students to work outside the classroom on a subject so current that it is not covered by the textbook and to motivate them with the thrill of discovering the leading edge. Topics include providing advice on which laptop to purchase, describing the problem of eWaste, and discovering new ways to present data. The appendix presents condensed discovery day assignments.

MULTI—DIMENSIONAL PROBLEM SOLVING

As indicated above, CS 101 familiarizes students with such general purpose applications as word processing, spreadsheets, and databases as well as HTML and programming in sealed modules that do not communicate with other. Moreover, problem solving is also taught discretely. A consequence is that students do not understand the relative strengths and weakness of the software, nor do they develop problem solving skills.

A multi-dimensional approach to problem solving tightly binds problem solving to more than one application. It forces students to solve the same program using multiple means, and it reveals the power and liability of different implementations of the solution. It also helps them to decide which problems are best handled by computer and which are not. For a teacher, the key is to select problems that lend themselves to solution by various methods.

The monkey and doors problem provides a rich example:

> There are 100 doors, all closed. In a nearby cage are 100 monkeys. The first monkey is let out, and runs along the doors opening every one. The second monkey is then let out, and runs along the doors closing the 2nd, 4th, 6th, … all the even-numbered doors. The third monkey is let out, and he attends only to the 3rd, 6th, 9th, 12th, … doors (every third door, in other words), closing any that is open and opening any that is closed. The fourth monkey does the same for the 4th, 8th, 12th, 16th, … doors, opening the closed ones and closing the open ones. The fifth monkey does the same to the 5th, 10th, 15th, … doors, and so on. After all 100 monkeys have done their work in this way, which doors are left open? (Derbyshire, 2002)

In addition to evoking a visually arresting image that can be dramatized in a classroom on a small scale, the problem is conceptually deep. If presented in a classroom situation, the first step is to ask the students to provide an intuitive answer. Some will say all the doors will be open, others that they will be all closed. Allowing the students to think about the problem and to visualize it yields the intuition that only doors with prime numbers remain open. This is an encouraging response because it indicates that some students have understood that the problem has something to do with division and that open doors will be associated with some set of numbers with a special quality regarding division.

The next step is to ask to test the intuition by using general methods for solving the problem. Invariably, one student will suggest working out the problem by hand, iterating through each step and recording the results. Then the results are examined to determine if a pattern emerges. This brute force method can be implemented in more than one way. Several implementations can be presented and evaluated. The first is literally by hand and by paper and pencil, but this is laborious, time consuming, and error prone. These deficits can be reduced but not eliminated by using general computer applications such as those bundled in MS Office. Several candidate applications can be considered. Using MS Word removes some of the tedium, but the tasks required, writing out a sequence of integers from 1 to 100 and recording the status of the doors after each pass, do not yield much to automation. The second candidate is a spreadsheet, which can considerably reduce the labor and the errors. A third candidate is a database, which can be quickly rejected for the brute force method because it provides few of the accounting resources needed. The final candidate is using Python to go through the problem.

Students quickly realize that the brute force method can be replaced by a reduce and conquer algorithm—perform brute force on a manageable subset of the problem and see if a pattern emerges. Reduce and conquer can be physically enacted in the classroom by handing out sheets with integers ranging from one to the class size. Initially, the students hold down all the sheets. The instructor then has the students raise or lower their sheets corresponding to which monkey comes through. At the end of twenty-five iterations, the numbers 1, 4, 9, 16, and 25 are clearly visible. Then students are asked to describe the pattern and the underlying reason for the pattern. They discover that perfect squares, numbers that have an odd number of factors, are left open.

The final level is to discuss how to automate the solution by determining, using software, which numbers are perfect squares and which are now. The problem for the students is, Which software application works best? The best way to engage students here is to divide them into groups based on software. One group analyzes using MS Word, another MS Excel, and so on. Each group must then present to the class the benefits and deficits of using the software assigned to them, and each must present an attempted but not necessarily a fully realized solution. The Ms Word group quickly abandons a simulation. The assignment provokes students to investigate data types and tables in MS Access in a way that goes beyond the standard examples contained in

the text and lab manuals. Some students even manage to discover SQL and macros. The group assigned to MS Excel learns how to create user-constructed functions. The Python group discovers how to write a function to test any particular number, and it quickly learns something about passing values into and out of functions. The competition among the groups accelerates their learning.

Outcomes

Tables I, II, and III present student assessments of all CS 101 sections and innovative sections. The assessments reveal the positive results gained from the innovations. The base line for assessments is Fall 2007. In that semester, the pre-innovative sections were assessed close to all other sections. Innovations were instituted Fall 2008, and they resulted in markedly better assessments. The mean for the innovative sections, 3.69 on a scale of 1 to 4, was 0.72 higher than the other sections, nearly one standard deviation (0.76) above the mean for those sections. Another dramatic contrast is revealed in comparing two sections from Fall 2008 in the innovative group. See Table II. One section used the innovative methods from the beginning, and the other did not implement them until mid-semester when the original instructor was replaced because of illness. The semester-long course was uniformly assessed better than the half-semester course. Strikingly, the full-semester course received perfect scores on two of the six objectives. This means that all twenty-two students gave the highest rating to the achievement of those two objectives.

Often, innovations yield significant but transitory gains. Table III illustrates that the gains in CS 101 are as long-ranging as they are dramatic, even though the initial games surpassed those in subsequent semesters. For the five semesters after the innovations, all sections declined to 2.96 from 3.04, but the innovative sections increased to 3.36 from 3.08.

Conclusions and Future Directions

The innovations described can materially advance the engagement of students in CS 101, and they can increase their knowledge of computer science. The outcomes have been such that two junior faculty have sat in on the innovative sections and have begun to adopt those innovations. Results from student surveys are not yet available, but the faculty members have had an increased in personal engagement and enjoyment of the course. Also, an objective measure of the success of meeting the course objectives will be instituted Fall 2011. All final examinations will include questions assessing those objectives.

Table I
Student Assessment of Objectives
Semester Prior to Innovations vs. Semester Immediately Following Innovations

Objective	Fall 2007 All Sections	Fall 2007 Pre-Innovative Sections	Fall 2008 All Sections	Fall 2008 Innovative Sections
1	3.04	2.90	3.00	3.65
2	2.87	2.94	2.90	3.60
3	3.04	3.24	2.90	3.60
4	3.00	2.98	2.90	3.60
5	3.14	3.12	3.00	3.85
6	3.17	3.31	3.10	3.85
Mean	3.04	3.08	2.97	3.69
N =	277	32	288	43

Table II

Student Assessment of Objectives
Semester-Long Innovations vs. Half-Semester Innovations

Objective	Fall 2008 All Sections	Fall 2008 Semester-Long Innovations	Fall 2008 Half-Semester Innovations
1	3.00	3.80	3.50
2	2.90	3.70	3.50
3	2.90	3.80	3.40
4	2.90	3.70	3.50
5	3.00	4.00	3.70
6	3.10	4.00	3.70
Mean	2.97	3.83	3.55
N =	288	22	21

Table III
Student Assessment of Objectives
Semester Prior to Innovations vs. All Semesters Following Innovations

Objective	Fall 2007 All Sections	Fall 2007 Pre-Innovative Section	Five Subsequent Semesters All Sections	Five Subsequent Semesters Innovative Sections
1	3.04	2.90	2.99	3.40
2	2.87	2.94	2.86	3.26
3	3.04	3.24	2.93	3.31
4	3.00	2.98	2.94	3.31
5	3.14	3.12	3.98	3.44
6	3.17	3.31	3.06	3.43
Mean	3.04	3.08	2.96	3.36
N =	277	32	664	104

Appendix

Condensed Samples of Discovery Day Assignments

Purchasing a Laptop Computer
I am planning to purchase a portable computer, and I am enlisting your support in this effort. In fashioning a recommendation, you should learn something about computer hardware. I want a computer that is mobile and costs less than $1,500. The primary applications are word processing, Web browsing, and Powerpoint. Video and audio are not high priority. The computer must run a current version of MS Windows, but a big plus would be a computer capable of running Leopard. In fashioning the recommendation, please consider clock speed, speed of the front side bus, hard-drive capacity, hard-drive type, system memory, communications capacity and expandability.

eWaste
A recent report calculated that a single search on Google generates as much carbon dioxide as boiling a kettle of water for a cup of tea. The Basel Action Network has warned that Microsoft has done little to mitigate the e-waste generated by the release of Vista, its latest operating system. More than 500,000 personal computers arrive in Lagos, Nigeria, every month from Western countries, and the 75% that do not work are dumped on sites that spread toxins to children. These facts and others dispel the myth that electronic technology has a minimal impact on the environment and on human beings.

Select one or more of the hardware components of a computer system. The component can be major or minor, central or peripheral. Learn about its function in the computer system and its internal construction.

Learn what materials are used to build it and how those materials are obtained. Find out what happens to the component when its useful life has ended. Draw some conclusions about what you have learned.

Presenting Data
Transforming raw data into a meaningful form is an important skill that can be realized either through verbal or visual means. That skill is as rare as it is valuable. It is especially important now because massive amounts of data require interpretation and presentation. This special project will increase your ability to present data in a meaningful way and to critique the presentation of data. It will also allow you to consider the relationship between presentation and interpretation. Email to me or hand in a presentation that includes
(1) an exemplary visual representation of data;
(2) A short , one or two paragraph, explanation of what the visualization says and why it is exemplary;
(3) A failed visual representation of data;
(4) A short , one or two paragraph, explanation of what the visualization tries to say and why it is a failure.

You can use the resources below or any other resource that you deem appropriate. You may work alone or in teams.

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CONCEPTUAL FRAMEWORK IN LEARNING AUTISM CHARACTERS THROUGH MULTIMEDIA LEARNING

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ABSTRACT

The purpose of this paper is to explain the related theoretical framework towards motivating the society in identifying Autism symptoms at the early stages by using multimedia learning. In order to achieve this objective, it requires solid foundation on theoretical philosophy on which explains the relationship of cognitive thinking particularly in learning theories and multimedia principles that can increase their level of awareness and motivations. The relationship of Cognitive Load, Constructivist Learning Environment and Motivations Theory and Multimedia Principle theory will be discussed thoroughly in this paper to strengthen researchers' assumption that autistic characteristics can be identified by using personalization multimedia learning. This paper will cover the current practice of identifying autistic characters in Malaysia and current problems faced by many society. The findings from this paper will lead to the proposal of Interactive Multimedia Learning Awareness (IMLA) tools so that it can help to perceive the awareness and motivation of preventing autism. This tool will also be used as an important aid by the parents who have autistic child and society in identifying the early characteristic of their children in future.

Keywords – *Cognitive Learning; Multimedia; Creative; Autism Characters;*

INTRODUCTION

Autism is a development disorder characterized by impairments in three areas namely communication, social and limited imagination resulting in very narrow interests and repetitive behaviors. Autistic symptoms normally affect between 1 to 3 years of ages and many parents do not know the basic symptoms as normally their characters are vary between them. During childhood, autistic children may fall behind their same aged peers in the areas of communication, social skills, and cognition. In addition, dysfunctional behaviours may start to appear, such as self-stimulatory behaviours, self-injury, sleeping and eating problems, poor eye contact, insensitivity to pain, hyper active and attention deficits. As reported in [2] (Jasni, Wan Ahmad Jaafar & Toh, 2010), the lack of awareness among society was the main factors of why autism is not well understood by the society. [6] (Mansor, 2010), supported that in view of the lack of knowledge and exposure, especially in Malaysia; autism is often misconstrued as mental illness. Consequently, these children are mostly kept at home, hidden from the outside world. Due to this, most of them do not have any chances like others such as in obtaining education, which is the basic human rights; and access to health care hence, we must take that decisive step forward and educate those around us on autism. We need to spread the awareness on autism. We need to teach the parents about the symptoms to look out for if they suspect their children could be suffering from autism. And we need to assure them that it is not the end of the road nor are they alone if their child is diagnosed as being autistic. At the same time, we could also encourage their autistic children to take care of themselves, so that they are able to contribute significantly to the society in the future. Melaka Tengah Autism Association (MTAA) president Ng Kek Kuan mentioned in [5] (Lai, 2010), autism is treatable and early intervention is crucial. She added parents should be aware of warning signs and symptoms of autism so that they can bring their child for diagnosis. Follow up with the necessary treatment right away. They must not wait and expect the child to catch up later or outgrow the problem. The more they know about autism spectrum disorder, the better equipped they will be to make informed decisions for their child.The main questions here is to what extend normal society can easily understand the symptoms of autistic children since this disorder behaviour are quite different between autistic children This paper will try to formulate the best approach of how

theoretical framework and multimedia principle can work together to form an alternative approach so that society can learn basic symptoms of autistic characters in the future.

CURRENT SCENARIOS

The biggest issues currently faced by Malaysia is shortage of health specialists such as physiotherapists, speech therapists and psychiatrists. Human Resource Minister revealed that Malaysia is short of physiotherapists and needs to produce more than 19,000 by 2020. This figures showed to us that the lack of expertise will resulting the less support needed by the parents in raising their autistic child's. The only hope for the parents to get the consultation is to send their child's to NGO's such **Nasional Autism Society(NASOM)** and **Resource and Education for Autistic Children(REACH)** where these center are providing one stop center in helping autistic child's. But most of these agencies are run without making any profits and they just rely on the grant given by the government. On the other hand, the facilities to support autistic children are vey limited especially in the government hospital and most of the cases of autism cannot be detected early as there are no proper facilities to diagnose the symptoms. To get a consultation from the government hospital, the autistic children always need to wait for weeks and may even get to see them once in three month. Other issues is that, not many doctors or specialists are interested in working with children with special needs especially autistic children. The situation might be related to the lack of incentive or not enough informations given by the authority. There are many attemps and approaches have been applied into the research and development to help the autistic children but most of them are too technical and only focus on to the autistic children only. None of the approaches cater for parents especially to increase awareness on how to identify the characteristic of autistic children. So the proper research on how to study the relationship on human behaviour using certain learning and multimedia theories are crucial in enhancing awareness among parents. So the needs for some kind of approach that can help shortening the identifying process will be developed and it requires some mechanism on how to educate parents to take extra steps in learning autistic behaviour. The formulations of suitable learning theories and multimedia principle will be used to design specific tools that help parents to increase their awareness regarding autistic children.

LEARNING THEORIES

Awareness

In order to increase the lack of knowledge, younger societies need to be aware with this issues and they need to have a new ways in learning Autism symptoms in general. Awareness as defined by [1] (Dictionary, 2010), is the state or ability to perceive, to feel or to be conscious, objects or sensory patterns. In this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. More broadly, it is the state or quality of being aware of something. Awareness implies knowledge gained through one's own perceptions or by means of information. There are three prosess involved in order to achieve awareness as stated here; **Perceive**, **Identify** and **Relate**. This process will lead to the perception which includes feelings, emotions, seeing, watching and making distinctions without judgment or reaction towards surrounding. As stated in [9] (Sciences, 2008), the study of self awareness is traced by **Shelley Duval** and **Robert Wicklund's** where at a given moment people can focus attention on the self or on the external environment. When self-focused, people compare the self with standards of correctness that specify how the self ought to think, feel and behave. The process of comparing the self with standards allows people to change their behavior and to experience pride and dissatisfaction with the self. The sense of awareness is important in learning characteristic of autistic child since it's related to the cognitive load theory of human as mentioned in below sentences.

Cognitive Load Theory (Sweller)

Cognitive load as stated by the [12] (Wikipedia, 2010), is a term that refers to the load on working memory during instruction on human brain. Instruction may be aimed at teaching learner's problem skill, thinking and reasoning skills. People learn better when they can build on what they already understand(known as schema) but the more a person has to learn in a shorter amount of time, the more difficult is to process that information in working memory. [10] (Sweller, 1998), developed cognitive load theory (CLT) which he proposed that learning can be enhanced by presentation of information. The theory assumes a limited working memory and a virtually unlimited long-term memory. Sweller suggested instructional designer should limit cognitive load by designing instructional materials like worked-example or goal-free problems. There are 3 main types of cognitive load; ***Intrinsic***, ***Extraneous*** and ***Germane*** Cognitive Load.

Constructivist Learning Environment (Jonassen)

In relations with cognitive thinking, to develop effective learning instructions requires the effective learning environment. Constructivism learning environment is a theory of knowledge that humans generate knowledge and meaning from an interaction between their experiences and ideas. [3] (Jonassen, 1999) proposed a model for designing constructivist learning environment. Since the epistemological belief of the constructivism that knowledge cannot be transmitted, the design puts the emphasis on providing learning experiences that facilitate knowledge construction and in meaning making. In the constructivist learning environment, learners are encouraged to engage **exploration**, **articulation** and **reflection** and instructor will encourage providing instructional supports.

Behavioral Changes (Prochaska, Norcross & DelClemente)

In order to motivate learners to learn certain instructions, behaviour of humans need to be studied to facilitate the learners to be aware and and manipulate the learning instructions easily. As stated in [11] (Toh, 2005), James Prochaska and his colleagues, John Norcross and Carlo DiClemente (1994) identified stages of behavioral change in a model that deserves consideration by instructional designers. The Stages of Change model postulates that there is a course of successful change comprising of six well-defined stages, namely **Pre-contemplation**, **Contemplation**, **Preparation**, **Action**, **Maintenance** and **Termination.** Each stage has specific tasks, which must be completed before moving on to the next stage. Most interestingly, the model claims that changes cannot be skipped for successful, sustained changed. Each stage requires different kinds of activities, and achievement before one can successfully lead to the next stage.

Elaboration Theory (Reigeluth)

In developing learning instructions project, the style of instructions level needs to construct in sequence. As supported by elaboration theory introduced by [8] (Reigeluth, 1992), is a strategy for conceptual presentation in which concepts are organized and presented in increasing order of complexity. Instructions should be organized in increasing order of complexity for optimal learning. For example, when teaching a procedural task, the simplest version of the task is presented first; subsequent lessons present additional versions until the full range of tasks are taught.

Motivation Theory (Keller)

After the completion of the learning process, learner will get an experience of how the multimedia learning can motivate themselves and they will be aware with the symptoms of autistic child in future. As stated in [4] (Keller, 2006), motivational design consists of a set of categories of motivational concepts and strategies that are derived from a synthesis of the research on human motivation combined with a review of successful motivational practices. According to Keller there are four major categories of motivational strategies that can help learners to increase motivation. They are Attention - The most important aspect of the ARCS model is gaining and keeping the learners' attention. Keller's strategies for attention include sensory stimuli (as discussed previously), inquiry arousal (thought provoking questions), and variability (variance in exercises and use of media).

Personalization Principles (Mayer)

The success of instructional design in this research will solely depend on the use of multimedia principle which in this study the personalization principle will be used as the main independent variable to increase awareness of autistic symptoms. [7] (Mayer, 2005d), defined the multimedia principle as an approach of people learn better when multimedia messages are designed in ways that are consistent with how the human mind works and with research-based principles. The use of Mayer personalization principles in this research is related with the theory of behavior of change from the Prochaska in term of building up the relationship of how human behavior react toward learning. This change of behavior is crucial in motivating the learner to take the early prevention of identifying the symptoms of autistic children. Normally, learning instruction is designed in formal way and the information presented to the learners was too formal. Under this theory, one personalization principles will be used as an independent variables, they are Infomal Conversational. Personalization principle will be effective when any processes to create or select e-learning courses that include some spoken or printed text that is conversational rather than formal are involved. According to cognitive theories of learning, humans strive to make sense of presented material by applying appropriate cognitive processes. People work harder to understand material when they feel they are in a conversation with a partner rather than simply receiving information. In other words people will be more comfortable when the information received came from source that are not too formal and they feel easy to adapt the sources. Instructional information is often written in a formal style in which the author seems invisible.

THEORETICAL FRAMEWORK

The theoretical framework as proposed at Figure 1, explained the overall structured and expected outcome of the research. This research will focus on knowledge acquisition of how human knowledge generated by memorizing the instruction given. The acquisition of empirical knowledge, which begins the process of filling the tabula rasa, is thus by means of the experience of sensation and perception. Perception is the retention of a group of sensations transmitted through the sensory system(s), which gives the knowing subject the ability to be aware. So this research will focus Knowledge Retention and Informal Conversation to be as Independent Variable and the expected outcome from this research will be to increase the perceiveness of Awareness and Motivations levels. The selection of the Cognitive Thinking and Age will be used as moderator variable. The next stage of development will be the the use of Allessi & Trollip in the development of the project and also the process of evaluating the data.

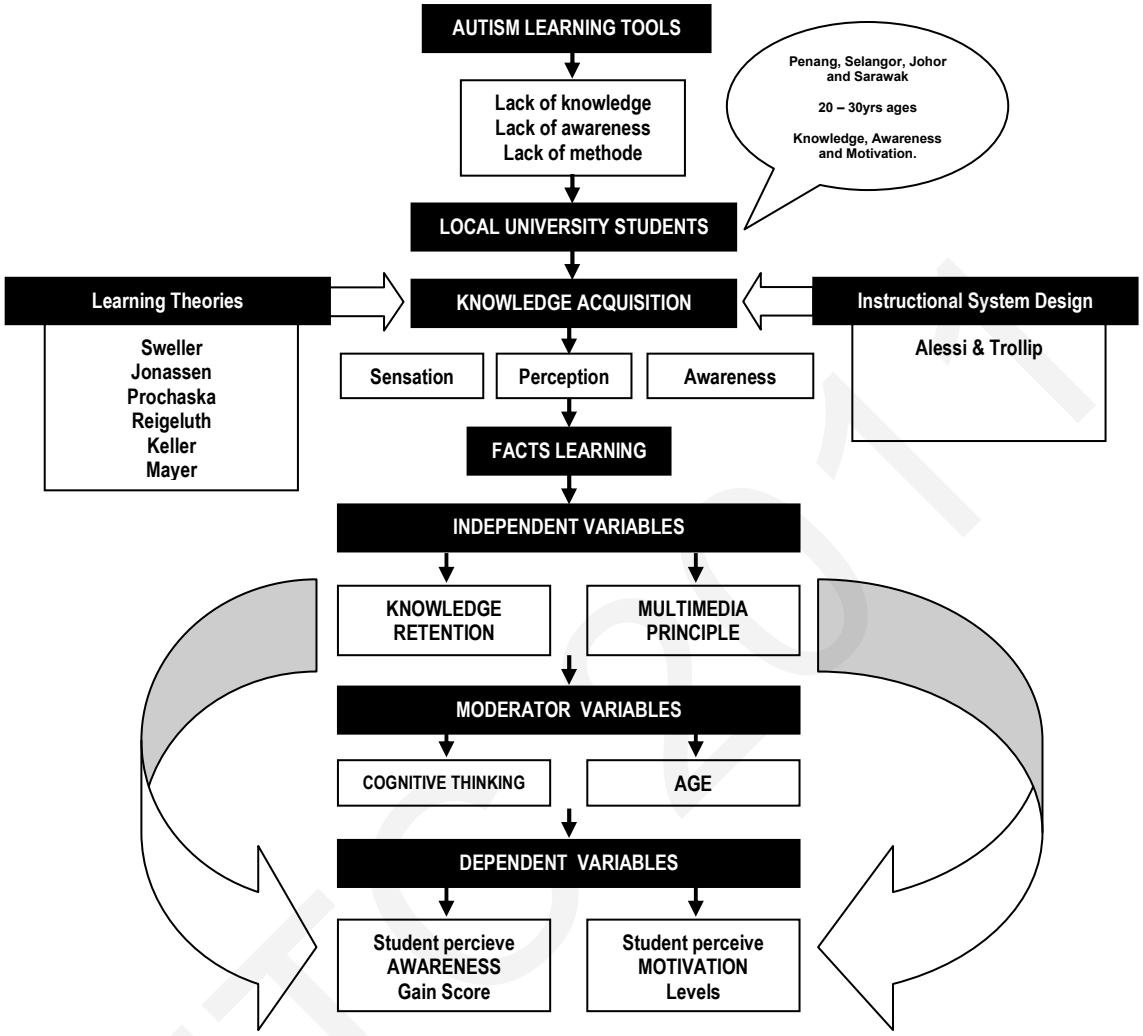

Figure 1: Theoretical framework of the Interactive Multimedia Learning Awareness (IMLA)

CONCLUSION

Based on aboved literature reviews, learning theories and multimedia principle, it shows that the awareness and motivation can be achieved if the proper theories and principles be implemented soon. The implementation of this theoretical framework is important because it will map all the theories and multimedia principle together to form a solid pathway for the development of the Interactive Multimedia Learning Awareness (IMLA). Another reason is to strengthen researchers' hypothesis of certain learning theories and multimedia principle could create an awareness of learning through proper multimedia learning approach. The selection of learning theories and multimedia principles in this research was done carefully in order to achieve the outcome which is to perceive awareness and motivation. Awareness is not something that we can achieve in one day since the characteristic of autistic children is different from child to child. With continued research and support from various parties it will help the awareness toward autistic children become norm and live it up amongst themselves. Once awareness is achieved it will help the society to be prepared, conscious and aware mentally and physically on how to deal with this autistic child if they are given one by God. With the current advances of ICT technology, such as multimedia learning, society will have greater access to learn, identify, recognize and consult with expert in lesser time than before.

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DESIGN A VIRTUAL ITEM BANKBASED ON IMAGE PROCESSING TECHNIQUE

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Abstract

One of the major weaknesses of the item exposure rates of figural items in Intelligence Quotient (IQ) tests lies in its inaccuracies. In this study, a new approach is proposed and a useful test tool known as the Virtual Item Bank (VIB) is introduced. The VIB combines image processing theory with the concepts of figural tests and Computerized Adaptive Testing (CAT). It is believed that this tool will assist in improving traditional figural tests – in terms of solving previous issues relating to item exposure and allowing a figural test to be more easily developed.

Keywords: Virtual Item Bank, Image Processing, Item exposure, CAT, IQ

INTRODUCTION

With the development of technologies, the computer has evolved into a tool that can improve the accuracy and efficiency of tests. In effect, computers have largely transformed the way in which testing has been conducted over the years. Computer-Based Testing (CBT) has been adopted both in Taiwan and overseas. Examples of CBT include the On-line Computer Basic Competence Test of High School and Vocational School Students (http://www.onlinetest.org/), the Graduate Record Examination (GRE), the Graduate Management Admissions Test (GMAT), and Test of English as a Foreign Language (TOEFL).

In comparison to the CBT, the Computerized Adaptive Testing (CAT) is a more complex form of testing. A CAT system chooses items for a given examinee based upon the examinee's responses to earlier items, as well as estimating one's ability according to his/her responses. As a result of the reduction in both testing time and testing items, many studies have since focused on the application of CAT (Steven & Barbara, 1989; Ho, 2000). Nevertheless, the problems associated with the development of item bank still remain unresolved, primarily due to manpower, budget and time constraints.

Figural tests are comprehensive mental ability testing tools for children and the illiterate. However, it is acknowledged that building a figural test can be rather challenging (Cronbach, 1990). There are at least eight figural test development steps, including designing test specifications, editing items, collecting pre-test data, analyzing items' parameters, revising items, selecting an appropriate scoring method, formal testing, and assessing the overall success of the test (Kingston & Stocking, 1986; Cronbach, 1990).

Item exposure rate is one of the most important factors that influences the security of a figural test. The most common way of reducing this risk is to impose a maximum exposure rate (r). Several other methods have also been proposed in line with this aim (Sympson & Hetter, 1985; Revuelta & Ponsoda, 1998; van der Linden & Veldkamp, 2006). All of these methods establish a single value of r throughout the test. In

this study, we present a new method, known as the Virtual Item Bank (VIB) method, which creates an item bank with unlimited items. We will attempt to describe the implementation of VIB and evaluate it's performance with an empirical experiment. In this way, item exposure rate is always 0. Hence, the problems associated with item exposure can be resolved.

LITERATURE REVIEW

Computer Figural Testing

Computer-based figural testing has been widely employed across various institutions, such as the Online Testing Center (http://www.onlinetest.org/), the center of Applied Psychology at Beijing Normal University (http://www.bnufr.com), and commercial web sites like IQTest (http://www.iqtest.dk/). These organizations provide useful computer-based figural testing tools and analytical (analysis) tools for researchers. However, only online versions are provided.

Lin (2001) has researched computer adaptive figural testing since 1998. His researches are based on the analysis of Raven's Advanced Progressive Matrices (APM) test structure, besides being responsible for the development of the New Figure Reasoning Test (NFRT). NFRT contains two main systems: the automatic item-generation system and the online testing system. The online testing system based on IRT theory is just an interface for collecting and evaluating the ability of examinees. The point of this study is an automatic item-generation system which contains an item generation algorithm and an item-generation engine based on APM.

Content-Based Image Retrieval

Generally speaking, figural tests were more difficult than text tests. In the selection verification, examinees paid full attention to the accuracy of the selection and the problem introduced by the option. As multimedia technology advances, this study would use data mining to help examinees solve the problem of selection verification.

Image comparison has been applied in many fields such as identity authentication, surveillance, human-computer interface, multimedia etc. In this research, content-based image retrieval techniques in image processing would be employed. Also, the main parts of the figure would be identified in order to perform data mining. The concepts and methods of content-based image retrieval are described below:

1. Formula without considering colour characteristics:

The characteristic vector is used in the computation to represent the figure, as shown below:

$f^{I}=(i_1, i_2, i_3, \ldots. i_n)$ ……(i)

f is the characteristic vector of the figure, and *n* is the code for the content characteristic.

The similarities of two figures are obtained by computing the Euclidean distance of the characteristic vector (as shown in Formula i). The smaller the value, the more similar the two figures and vice versa.

$$d(Q,I)=\sqrt{\sum_{j=1}^{n}(f_j^Q-f_j^I)^2} \quad \text{.....(ii)}$$

while $d(Q,I)$ is Euclidean distance of the characteristic vector of figure I and Q.

2. Formula that considers colour characteristic:

Mehtre, Kankanhalli, and Lee (1998) proposed a solution to consider the figure colour and shape together to calculate the figure similarity. The formula for the colour distance is shown in Formula iii. While clustering 400 x 400 figure colour, the minimum threshold of the colour distance between each cluster was set to 50.

$$\text{Colour distance}=\sqrt{(\Delta R)^2+(\Delta G)^2+(\Delta B)^2} \quad \text{.....(iii)}$$

Formulas that consider the colour instead of colour characteristics helped generate suitable answers in this study.

METHODS

The objective of this study is to propose a new concept – Virtual Item Bank, and to show how this concept is used in the figural test. The following is a discussion on the problems and the demands of item bank generation we encountered in addition to the development of the research tools.

DEVELOPMENT OF THE RESEARCH TOOL

This research has developed two research tools: 1. Virtual Item Bank System; 2. CAT system. The system structure and functions of these two tools are described as follow.

Virtual Item Bank System (VIBS):

In VIBS, the item database no longer stores large amounts of items; instead, it saves two elements to replace the traditional items:

1. Basic figure element

This system no longer requires saving a large amount of figural items. Instead, items were built upon three basic figure types: line, circle and multilateral. Not only does this lower the memory space requirements, but it also reduces the probability of item exposure.

2. Solution Processes

The examinees' solving processes and abilities were defined by specialists and converted to mathematical formulas which could be manipulated by computers and stored in the hypothetical item database. Using this data along with the basic figure elements, the computer can produce mass items and lower the work load for test preparation.

The VIB which replaces the traditional item bank is illustrated by the flow chart below.

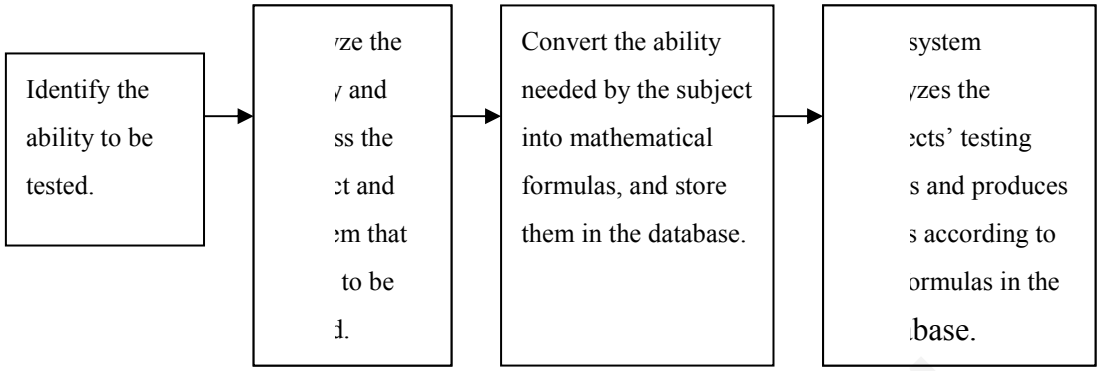

Figure 1. Flow chart of VIB

CAT System

The main function of CAT system is to select appropriate items for examinees and evaluate examinees' ability based on IRT model. In producing items, CAT system is only an application interface, and does not perform image process, item design or retrieval. These tasks are done by VIBS, and the results are sent back to CAT system to administer tests. In terms of ability evaluation, this system uses IRT to process. The psychometric model includes Rasch model, Two-parameter models (2PL model), and Three-parameter models (3PL model).

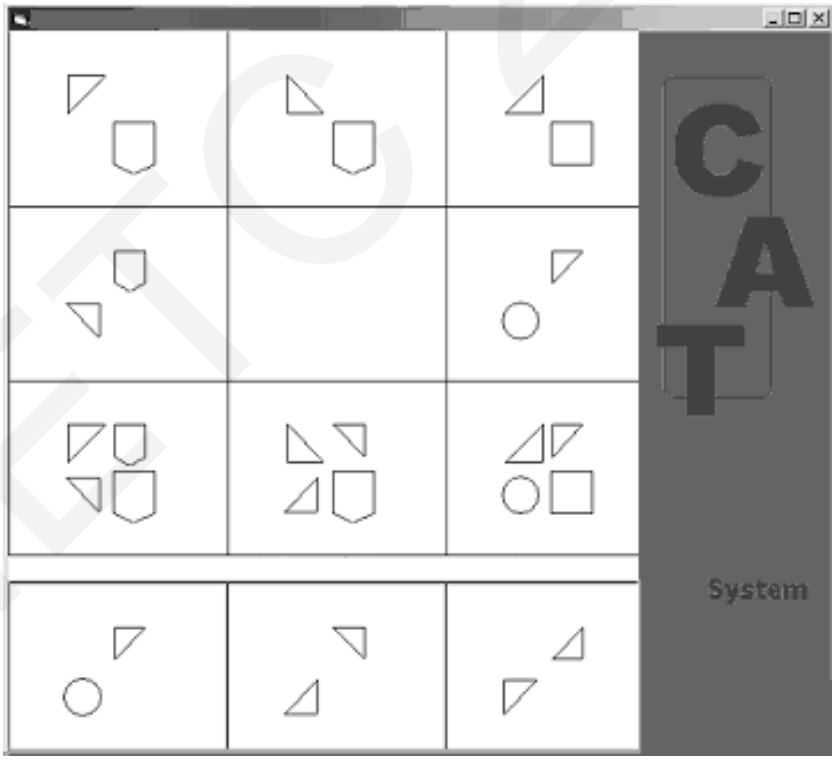

Figure 2: CAT system

The figure above represents the issues of the problem and demands of item bank generation, in addition to the development of research tools. The research tools helped test editors to solve the problem of the item exposure rate. A simulation of the item overlap rate will be discussed and proved in the following section.

RESULTS

The Item Rule Definition

In this study, a VIB has been built specifically for figural testing. This VIB contains 48 rules. Each rule is composed of an image processing operation and a problem-solving process.

Parameter Estimation

The primary parameter of this study was item difficulty parameter. An experiment deploying an online CBT system was designed to collect and estimate the items created by the VIB. 310 elementary school students participated in this experiment. The results of this experiment are presented in table 2. The structure of the CBT system and the results of the estimation are discussed in the following paragraphs.

An online CBT system is use to collect data of the item-generation rules in the VIB. An instruction example of this system would show to examinees before testing start. When examinees finished the test, the results would be transfer to the server and be analyzed in a short time.

Table1. *Results of item difficulty parameters generated by the rule A, B, C*

Rule A	Difficulty	Rule B	Difficulty	Rule C	Difficulty
A-1	0.63	B-1	0.5	C-1	0.28
A-2	0.69	B-2	0.5	C-2	0.39
A-3	0.67	B-3	0.56	C-3	0.41
A-4	0.7	B-4	0.53	C-4	0.38
A-5	0.73	B-5	0.59	C-5	0.34
A-6	0.72	B-6	0.52	C-6	0.16
A-7	0.72	B-7	0.52	C-7	0.25
A-8	0.64	B-8	0.59	C-8	0.42
A-9	0.81	B-9	0.59	C-9	0.34
A-10	0.72	B-10	0.48	C-10	0.38

Table 2. Standard deviation of difficulty parameter of rule A, rule B, and rule C

Rule A	Rule B	Rule C
0.051218	0.04158	0.082226

The VIB generated items with similar item difficulty parameters by the same rules. The result indicated that the item difficulty parameters created by the same rule were closed to each other, which meant that the VIB is a powerful tool, and it can solve the problem of item exposure.

The Item Overlap Simulation

In this study, an item overlap simulation was conducted. According to the item overlap rate (given in formula ix), when max length of the test = 48, subjects = 30000, the simulation results are as follows.

Table 3. *Results of the item overlap rate simulation*

Item overlap rate (R)	2.43488E-10
Mean of test length	36.5078
Mean of Theta-Estimated	-0.106
Mean of SE	0.4023

CONCLUSION

From the results of item overlap simulation, it is obvious that the VIBS can resolve the problem of item exposure efficiently. Every examinee got different items on the same test. This allows the VIB to be used not only in measurement but also in practice. The results of the experiment showed its evident effects in practice.

In the VIB, the item was generated dynamically. It was however difficult to apply it in the CAT system. In order to solve this problem, two CBT testing systems were designed to collect the item difficulty parameters of the item generation rules. Table 3 and table 4 demonstrate that the items generated by the same item generation rule have approximately the same item difficulty parameters.

These results show that a CAT system can contain a VIB; however, there are still many different types of tests needed to be analyzed which will be the focus for the future work of our research.

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DESIGN AND IMPLEMENTATION OF ADAPTIVE SEQUENCING BASED ON GRAPHS

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ABSTRACT: A major challenge in developing systems of distance learning is the ability to adapt learning to individual users. This adaptation requires a flexible scheme for sequencing the material to teach diverse learners. This is where we intend to intervene to model the personalized learning path to be followed by the learner to achieve its educational objective determined. Our modeling approach of sequencing is based on the pedagogical graph which is called SMARTGraph. This graph allows to express the totality of the pedagogic constraints under which the learner is submitted in order to achieve his/her pedagogic objective. SMARTGraph is a graph in which the nodes are the learning units and the arcs are the pedagogic constraints between learning units.

We shall see how it is possible to organize the learning units and the learning paths to answer the expectation within the framework of individual courses according to learner profile or within the framework of group courses. During the learning process, the system generates, for each learner, the set of specific learning units according to his/her profile and to the selection criteria (objective, cognitive style, language, configuration, rate).

To implement our approach we used GraphML (Graph Markup Language) to define the graph structure and SVG (Scalable Vector Graphics) to describe the visual properties.

Keywords: E-learning, pedagogical graph, adaptability, profile, XML, GraphML, SVG

1. INTRODUCTION

The sequencing of the course has a direct impact on the effectiveness of learning, so it is present in several areas of research. In the context of Adaptive Hypermedia systems applied to distance learning, sequencing of content should be carefully designed so that the learner does not get lost in hyperspace (De Bra , Houben and Wu ,1999). The content to be presented to learners must be selected to adapt in terms of presentation and navigation. The sequencing of content has also a vital part in the Intelligent Tutoring Systems (ITS) (Brusilovsky and Vassileva, 2003) which are developed under the hypothesis that computer systems can model human learning and in selecting the best scheduling strategy learning for each learner. The objective of the majority of ITS is to adapt their training offer, in a dynamic way, according to pedagogical rules but also depending the reactions of the learner (Brusilovsky and Peylo, 2003).

In parallel with this research on sequencing, considerable effort has been devoted to developing standards to enable systems-based learning on the web to find, share, reuse, and export content in a standardized way (ADL, 2004). The function of the sequence was included in the specifications of the standard IMS Simple Sequencing (IMS, 2003). This feature provides the learner the sequencing of content in order to guide the learning space. IMS Simple Sequencing is based on the strategy already established by the designer of the content.

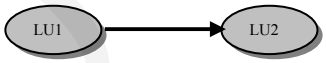
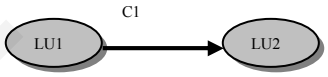
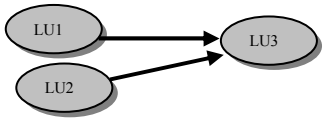
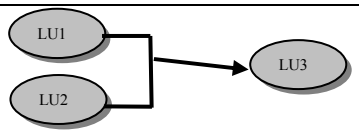
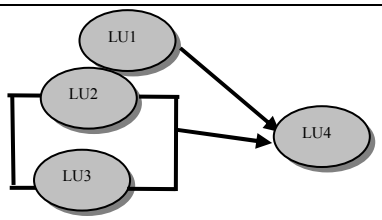
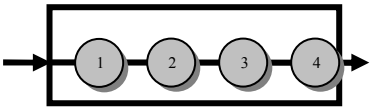
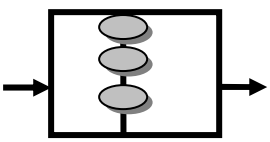
In our approach the teaching course/path was designed to allow each learner to express its capacities as well as possible, and to build assets in agreement with its pedagogical objectives. The course is composed of learning units (LU) and which are interrelated by pedagogic relations. It is up to the pedagogic sequencing to define these relations. It will have to determine which LU will be presented to the learner and when it will take place. It must also allow not only the conditionally branch from one learning resource to other learning resources, according to whether the learner has carried out certain stages or obtained a sufficient note, but also the fact that this last is permitted to subscribe in a LU. The pedagogic sequencing is the result of the application of composition techniques which can be, for example, the browsing of the tree structure in a linear way from a LU to another. A more complex pedagogic sequencing can be based on the achievement of certain LUs, as prerequisite LUs, on the learner preferences or on the evaluation results.

SMARTGraph is a pedagogic graph which is included in this perspective of the pedagogic sequencing modelling. It is a pedagogic graph where the nodes represent the LUs, and the arcs represent the pedagogic relations between these LUs.

2. THE GRAPH OF PEDAGOGICAL PROGRESSION

The pedagogic graph SMARTGraph is used for implementing the sequencing. In SMARTGraph the nodes represents the learning units and the arcs (links) are the pedagogical constraints between learning units. In order to express the pedagogic constraints, we use the prerequisites formalism. A prerequisite of a LU is the set of the knowledge necessary to follow this LU in order to achieve a defined objective (Elouahbi and Outtaj, 2003).

In order to express the sequencing, we use the prerequisites formalism. A prerequisite of a LU is the set of the knowledge necessary to follow this LU in order to achieve a defined objective. Using this formalism, the notation used to express that the LUi is a prerequisite of the LUj is as follows: Pr(LUj)=LUi. The table below summarizes the logic operators used in the prerequisite based formalism.

Symbol	Meaning	Example	Graph
NULL	No prerequisite	Pr(LU1) = NULL There is no LU required to follow LU1	
	A simple prerequisite	Pr(LU2) = LU1 The learner can follow LU2 if he/she has followed LU1. It is equivalent to an unconditioned sequencing between two LUs of a graph.	
:c	A prerequisite with a condition	Pr(LU2) = LU1 : C1 The learner can follow LU2 if he/she has followed LU1 and satisfied the condition C1. It is equivalent to an conditioned sequencing between two LUs of a graph.	
&	A LU with many prerequisite LUs	Pr(LU3)= LU1& LU2 The learner can follow LU3 if he/she has successfully followed LU1 and LU2.	
|	Choice between many LUs	Pr(LU3)= LU1| LU2 The learner can follow either LU1 or LU2 to consider that the group LU1, LU2 has been done.	
()	Evaluate first	Pr(LU4)= LU1& LU2| LU3 The learner can follow LU4 if he/she simply has followed LU3 or (LU1 and LU2) But if we add () like this Pr(LU4)= LU1 & (LU2|LU3) The learner can follow LU4 if he/she has successfully completed LU2 or LU3 and the LU1.	
$[]_{n/m*}$	Choice of n LU among m with constraint on the followed order as prerequisite	$[LU1, LU2, LU3, LU4]_2$ 2 LUs of the group are sufficient to consider that the group has been done, but the order must be respected.	
{}n/m	Choice of n LU among m without any constraint on the followed order as prerequisite	Pr(LU5) = $\{LU1, LU2, LU3, LU4\}_3$ 3 LUs of the set LU1, LU2, LU3, LU4 are sufficient to allow access to LU5.	

Then, once the course is generated, the learner starts the first part, and at the end of this part, the system must take into account the learner interactions during this learning unit. The learner will then have to access to a specific learning unit if necessary with a modified profile. The transition from an educational sequence to another is then made according to an educational approach.

The total graph is deduced starting from the prerequisites expressions, because each definition of prerequisites makes it possible to deduce a portion from the pedagogical graph. This made, the fusion of the whole of under graph makes it possible to reconstitute the general graph. The following expressions formalize the pedagogic graph of figure 2.

1) Pr(LU1)= NULL
2) Pr(LU2)= LU1 | LU2 : C1
3) Pr(LU3)= LU2 & LU6
4) Pr(LU4)= LU3
5) Pr(LU5)= LU3
6) Pr(LU6)= LU1
7) Pr(LU7)= LU6 : C2
8) Pr(LU8)= LU7 & (LU4 | LU5)

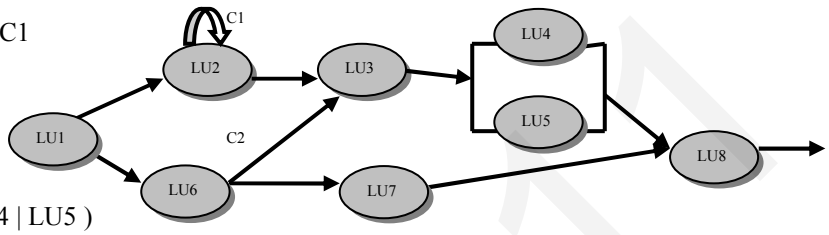


Figure 2: Example of SMARTGraph

3. IMPLEMENTATION

Our objective is to provide an adaptive sequencing across pedagogical sequence, need for a good definition and structuring of the course documents is obvious for a comprehension of this structure and this definition by the system in order to extract some information targeted to provide a course sequencing adapted to each learner profile (conf figure 3).

In the search for a solution to our needs, our choice was made on XML to describe the structure of course and SVG (Scalable Vector Graphics) a modularized language for describing two-dimensional vector and mixed vector/raster graphics in XML (W3C, 2011), to describe and represent the pedagogical graph. Indeed the automatic generation of the course was facilitated by the use of XML parsers, SVG Parser, SVG Generator and the SVG DOM, etc.

The adaptation of the course sequencing according to the user profile (IMS LIP, 2001) is made possible using XSLT. It will first of all be necessary to adopt a structure defining the relationship between the course and the profile.

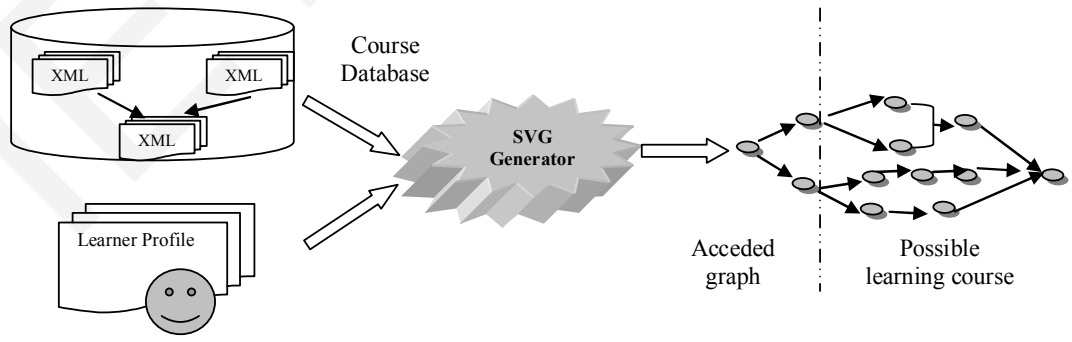


Figure 3: Implementation of SMARTGraph

The generation process consists in generating the already accomplished course by learner in the first part of the graph and all the others possible courses in the second part. The continuation of learner the course will be done according to its personal choices, and especially to his profile evolution.

3.1. Generation Process

As showing in figure 4, starting from the list of the expressions of the prerequisites described in the prerequisite xml file, we generate generic GraphML (GraphML, 2001) corresponding to the total pedagogical graph via an XSLT transformation.

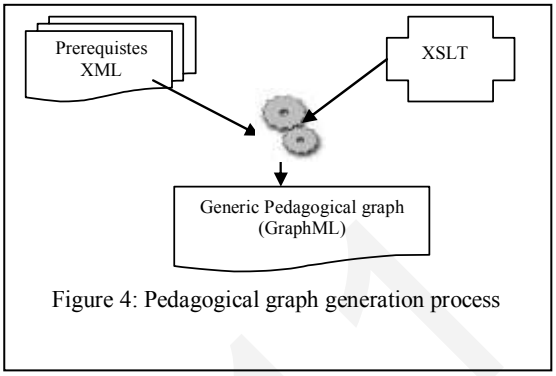


Figure 4: Pedagogical graph generation process

Example 1:

Prerequisites XML file

```
<prerequisites>
<prerequisite idLU = "chapter3">
<operator type="and">
        <LU id = "chapter1"/><LU id = "chapter2"/>
</operator></prerequisite>
<prerequisite idLU = "chapter4">
<operator type="simple">
        <LU id = "chapter3"/></operator>
----------
</prerequisite>
</prerequisites>
```

Example 2:

Generic GraphML file

```
<graph edgedefault="undirected">
<desc>A GraphML file</desc>
<node id="chapter1"/><node id="chapter2"/>
<node id="chapter3"/><node id="chapter4"/>
-----------
<node id="chapterN"/>
<edge source="chapter1" target="chapter3"/>
<edge source="chapter2" target="chapter3"/>
<edge source="chapter3" target="chapter4"/>
-----------
<edge source="chapterY" target="chapterZ"/>
</graph>
```

3.2. Adaptation Process

As showing in figure 5, knowing that each learner has a profile which is brought to change constantly during all the learning process, it is unimaginable to envisage all possible XSLT transformations being able to be applied to the pedagogical graph. This led us to choose on the solution of a generic XSLT file containing a certain number of parameters which have a direct relationship with the profile. Thus the parameter setting of this generic XSLT by the profile item will dynamically give a specific XSLT according to this profile (Conf example 4). The transformation of the generic XSLT into specific XSLT will be done by using XML parser.

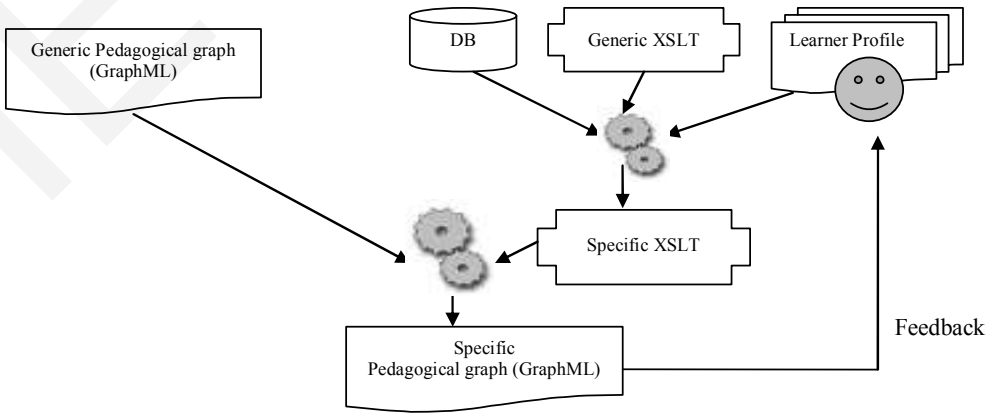


Figure 5: Adaptation process

Example 3:

Fichier XSLT générique

```
<xsl:transform
xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
version="1.0">
<xsl:variable name="Language" select="""/>
<xsl:variable name="List_LUs" select="""/>
<xsl:variable name="Obj_Pedag" select="""/>
        <xsl:template match="/">
                <xsl:for-each select="Graph">
                        <xsl:choose>
                        ----------------------------
```

Applied to the values of the following profile:

Pedagogical Objective	Engineer
List of achieved LUs	chapter1, chapter2
Language	French

Give the specific XSLT above:

Example 4:

Fichier XSLT specifique

```
<xsl:transform xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
version="1.0">
<xsl:variable name="Language" select="french"/>
<xsl:variable name="List_ LUs " select="chapter1, chapter2"/>
<xsl:variable name="Obj_Pedag" select=" Engineer ""/>
        <xsl:template match="/">
                <xsl:for-each select="Graph">
                        <xsl:choose>
                        -------------------------
```

Thus, to generate the GraphML graph specific to a profile, it is necessary to apply to the generic pedagogical graph GraphML XSL transformation specific to this profile. Applied to the specific XSLT of example 4 gives the Specific pedagogical Graph (GraphML) below:

Example 5:

Specific GraphML file

```
<graph edgedefault="undirected">
<desc>A GraphML file</desc>
<node id="chapter1"/><node id="chapter2"/>
<node id="chapter3"/><node id="chapter4"/>
<edge source="chapter1" target="chapter3"/><edge source="chapter2" target="chapter3"/>
<edge source="chapter3" target="chapter4"/>
</graph>
```

3.3. Visualization Process

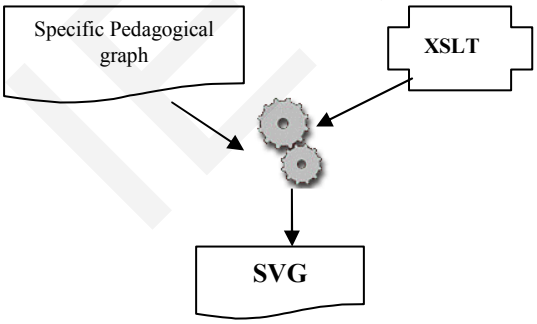


Figure 6: Visualization process

The Specific teaching Graph (GraphML) being obtained, it is necessary to apply a style sheet XSL to him to transform it in SVG format (Jolif, 2003) which can be visualized in a navigator having the suitable plugging (Adobe, 2011) (conf example 6).

Example 6:

Specific SVG file

```
<svg width="8in" height="11in">
<defs>
<marker id="arrow" --- markerHeight ="10" orient="auto">
<path class="edge" d="M0 0 10 5 0 10z"/></marker></defs>
<g>
<circle id="chaptre1" cx="200" cy="50" r="50" fill="lightgrey"/>
<text text-anchor="middle" x="190" y="50">chapter1</text></g>
<g>
<circle id="chaptre3" cx="400" cy="200" r="50" fill="lightgrey"/>
<text text-anchor="middle" x="395" y="205">chapter3</text></g>
<g>
<circle id="chaptre2" cx="200" cy="350" r="50" fill="lightgrey"/>
<text text-anchor="middle" x="200" y="345">chapter2</text>
</g>
----------------------
</svg>
```

4. CONCLUSION AND PERSPECTIVES

SMARTGraph allows the real-time modeling of the choice and the succession of the courses, or the parts of a course, that a learner operates during his/her training. This modeling consists in presenting the pedagogic relations between the different parts of a course, or a cursus, by the mean of algebraic operators. These operators are used, in this sense, as constructors of the sequencing of the parts of a course for a learner's profile at a given time. In this way, this sequencing allows or not to specify access instructions according to the operators result. By basing us on standard technologies such as XML, XSLT, SVG, GraphML in our system implentation, we proved the relevance of the concepts which we defined. Moreover, we will plan thereafter to apply verification techniques on the graph in order to produce a course that is coherent, consistent, and which does not present problems of infinite looping or deadlock.

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DETERMINING PROSPECTIVE ELEMENTARY SCIENCE TEACHERS' AGRICULTURAL LITERACY WITH e-DIALOG JOURNALS

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Abstract

Data from several research studies displayed misconceptions in agriculture. Agricultural literacy and environmental awareness of young individuals have an undeniable effect on the life of next generations. This research study explores prospective science teachers' understandings about agriculture and proposes dialog journal model for determining agricultural literacy among participants. Thirty prospective elementary science teachers participated in this research study. A questionnaire, developed by the researcher, on agricultural literacy was administered to participants at the beginning of the semester. The model used in this research includes six-week activity sheets and each activity sheet has a case to reflect. Research participants were asked to keep dialog journals, which are e-journals, for each activity sheet. Researcher analyzed participants' reflections in journals qualitatively, and integrated with the quantitative analysis of questionnaire. An assertion with 3 subcategories was formed to explain agricultural literacy of the participants.

Keywords: agricultural literacy, environmental awareness, agricultural education, prospective elementary science teachers

Introduction

High rate of increase in population, lack of foods for well nutrition, changes in seasons and many other factors related to the environment we live, lead us put more emphasis on agriculture to continue our life. Knowing and understanding of agriculturally related scientific and technologically-based concepts which were included in the processes required for personal decision making, participation in civic and cultural affairs, and economic productivity is known as agricultural literacy. The roots of agricultural literacy can be traced to instructional efforts in public and private schools beginning in 1821 in the world as cited in Birkenholz, Frick, Gartin, Hoover, Jewel, Terry, Bishop, Steward (1992). Basically, Wright, Stewart and Birkenholz (1994) related individual's knowledge about agriculture to their agricultural literacy. Individual's agricultural literacy is affective on their attitudes and actions in producing a public policy about the issue. Frick, Birkenholz, and Matchmes (1995) pointed out that agricultural literacy is based on the premise of "every person should possess a minimum level of knowledge of the industry which produces food needed for human to survive".

Literature review about agricultural literacy displays no consensus on definition of the term. Philosophical, political and epistemological differences among specialists were cited as reasons of this situation (Powell, Agnew, Trexler, 2008). Wright et al.(1994) linked agricultural literacy and agricultural awareness in their definitions of the term. They defined literacy as an attitude toward the world. Based on this definition of agricultural literacy, agricultural awareness was defined as having positive attitudes and association with agriculture. While Wright et al. (1994) defined the term as attitude, Frick et al.(1995) defined agricultural literacy as not an attitude but knowledge and perception regarding agriculture, food and national resources.

Based on the philosophical, political and epistemological differences among specialists, there are three approaches to agricultural literacy reported by Powell et al. (2008) as programmed agricultural literacy (deductive model), emergent agricultural literacy (inductive model) and agriculturally literate value judgment (evaluative model). Perceived lack of utility outside the agriculture field, timing and opportunity and a dichotomy of purpose regarding agricultural literacy within education are cited among the barriers to development of a shared vision for agricultural literacy (Powell et al, 2008). Several research studies addressed the definition and benefits of agricultural literacy and collaboration between science and agriculture teachers (Wright et al., 1994; Frick et al., 1995; Knobloch, Ball, Allen, 2007; Thompson, Warnick, 2007; Stephenson, Warnick, Tarpley, 2008; Cannon, Broyles, Anderson, 2009). Knobloch (2008) argues elementary students' need for authentic learning and issues like food, agriculture and natural resources in elementary classrooms bring learning to life. Therefore; elementary school teachers need to be well informed and equipped about these issues to generate authentic learning environments. It is also a known fact that

individuals' philosophies and epistemologies effect their beliefs and mental images which reflect their attitudes and practices in classroom (Knobloch, 2008). Do elementary teachers have a chance to be well informed about agriculture in their undergraduate years? Based on the literature review cited above, prospective elementary science teachers' knowledge and understandings about agriculture, which refer to their agricultural literacy, were examined in this research study.

Method

This is a mixed method research study designed with the purpose of answering the following research questions:

1. What is the overall agricultural literacy level of prospective science teachers?
2. What is the participants' level of understandings with regard to the components of agricultural literacy?

Participants and the Context

Research participants were thirty prospective elementary science teachers volunteered to participate in this research. Participants were attending "environmental science" course during Spring 2011 semester in a big scaled university located in Marmara region.

"Environmental science" is a 3-credit theoretical course, which includes agriculture and environment relations in its chapters. The researcher was the course instructor. The course was designed in a technology-integrated way. Therefore; PowerPoint presentations and shared social networks were the fundamental issues of the course. An e-group called "agricultural literacy" was formed and all participants were asked to keep a journal within the framework of this e-group. Journals kept by the participants let them share their views and understandings both with each other and the researcher.

Data Collection

At the very beginning of the Spring 2011 semester, the researcher developed a questionnaire to understand participants' understandings about agriculture and its effects. The questionnaire consisted of 15 likert-type items prepared within the framework of seven agricultural literacy concept areas defined by Frick et al (1995). Three of these areas were emphasized in the questionnaire. Seven areas of agricultural literacy, mentioned above, and related item numbers in the questionnaire is presented in table 1.

Conceptual areas of agricultural literacy	Item numbers in questionnaire
1. Societal and global significance of agriculture	5,6,7,8,9,10,11,12,15
2. Public policy in agriculture	5,6,8,12,13
3. Agriculture's relationship with environment and natural resources	1,2,3,4,13,14
4. Plant science	no item
5. Animal science	no item
6. Processing of agricultural products	no item
7. Marketing and distribution of agricultural products	no item

Table 1: item numbers and conceptual areas of agricultural literacy represented in the questionnaire

Questionnaire was the primary data source used to answer the first research question. e-dialogs were the second data collection technique developed and used by the researcher in order to get prospective science teachers' understandings about second research question. The e-group, agricultural literacy, was formed within a famous social network, facebook. Then, three scenarios, based on the three areas of agricultural literacy, mentioned in table 1, were written with the purpose of understanding participants' knowledge and understandings in details. The researcher shared a scenario per two weeks throughout the semester. Each scenario has a question to reflect. Participants' reflections to these questions formed the secondary data source.

Data Analysis

Data collected with the questionnaire were analyzed quantitatively with the basic descriptive statistics. Participants' overall and in detailed descriptive values, frequencies and mean values, are listed in table 2 as follows.

Item number	N=30		Mean values for each item
	Frequency of Acceptable answers (f)	Frequency of unacceptable answers (f)	
1	29	1	4,36
2	28	2	4,26
3	25	5	3,90
4	22	8	3,90
5*	11	19	2,93
6*	19	11	3,76
7*	18	12	3,40
8	26	4	4,16
9*	10	20	3,06
10	25	5	4,10
11	28	2	4,46
12*	16	14	3,50
13	28	2	4,13
14*	12	18	3,46
15	26	4	4,16

Table 2: basic descriptive values for items

Participants' mean values for each conceptual areas of agricultural literacy are presented in table 3 below.

Conceptual areas of agricultural literacy	Mean values
1. Societal and global significance of agriculture	3,72
2. Public policy in agriculture	3,70
3. Agriculture's relationship with environment and natural resources	4,00
4. Overall questionnaire	57,60

Table 3: mean values for conceptual areas of agricultural literacy

Table 2 and 3 display a general overview and detailed basic statistical information about the areas of agricultural literacy mentioned in table 1.

Based on the data gathered, secondary data sources, scenarios, were qualitatively analyzed. Each scenario has a question to be reflected at the end and each scenario represents different areas of agricultural literacy. Therefore; for each area, participants' reflections to questions were analyzed separately. The analysis corresponds open-coding and codes from open-coding were grouped to get categories. Then, categories from the codes were again grouped to form assertions about participants' agricultural literacy level in different conceptual areas. Qualitative analysis of participants' reflections to scenarios, presented via internet, was introduced in the following findings and discussion section.

Findings and Discussion

This section includes research findings with respect to research questions.

- What is the overall agricultural literacy level of prospective science teachers?

Participants' mean value for questionnaire was 57, 60 as presented in table 3. The lowest and highest points that a participant can get from the questionnaire were 15 and 75 respectively. Table 4 shows point intervals and how they were described.

Point interval	Description
15-44	Undesired level
45-60	Moderate level
61-75	Desired level

Table 4: point intervals and descriptions

According to point intervals in table 4, participants' mean value for questionnaire display that participants were at the moderate level in agricultural literacy. Although research participants could be counted as having moderate level of understanding in agriculture, some items presented with star in table 2, display that half of the participants had lower level of understandings about the issues represented in these items. These items were 5,6,7,9,12,14 numbered ones. Data analysis for these items will be presented within the second research question as follows.

- What is the participants' level of understandings about the components of agricultural literacy?

Quantitative data analysis gives an overall view about participants' understandings and knowledge about agriculture. Participants' level of understanding may change when data examined according to subareas of agricultural literacy presented in table 3. Following table 5 presents mean values and descriptions for each subarea.

Mean values	Description
1,00-3,00	undesired
3,01-4,00	moderate
4,01-5,00	desired

Table 5: mean values and descriptions for subareas of agricultural literacy

When table 3 was examined under the light of information given in table 5, mean values for each subarea are consistent with participants' overall level of understanding. Mean values change between 3,70-4,00. Therefore; this also shows that participants are at the moderate level in subareas of agricultural literacy.

Qualitative analysis of data explains and exemplifies participants' understandings about the subareas of agricultural literacy. It also supports the findings presented in this section. At the end of qualitative data analyses, following assertions were formed.

Assertion A: societal and global significance of agriculture

Prospective elementary science teachers, participated in this research study, do not have adequate understandings about the societal and global significance of agriculture.

Although table 3 shows 3, 72 as the mean value for this subarea, participants' reflections to scenario one display inadequate knowledge and understanding about the issue. Scenario one was emphasizing societal problems like hungry, drought and obesity in different regions of the world. In the question at the end, participants were expected to relate these problems and their solutions, to some extent, with agriculture. Almost none of them phrased agriculture, and most of them relate the problems with economy. Excerpts from the participants' reflections, presented below, exemplify the point.

"…people eat a lot in one place and some struggles with hunger. This is not adequate… rich people may eat less and save some money…well…then they may share this money with others…I think the money solves all…" (P1).

"…it is something related to the budget that a country allocates for peoples' health…countries like US may save some money from consumption and send it to other countries like Africa…" (P7).

The excerpts above display inadequacy of participants' knowledge and understanding. Participants' mean values for the questionnaire items, listed in table 1 to represent this subarea, also show this inadequacy. Item 7 argues that agricultural production in the world is sufficient to feed the world's population. Item 9 asks for the self sufficiency of knowing agriculture and its effects. 18 out of 30 participants gave desirable answers to item 7. That is, more than one third of research participants (12) were not aware of the fact that agricultural products were not sufficient to feed the world's population. Additionally, 10 out of 30 participants gave desirable answers to item 9. That is, two third of the research participants (20) had low self evaluation about their knowledge on agriculture and its effects.

Assertion B: public policy in agriculture

Although almost all participants believe the importance of knowing and understanding agriculture and its effects including the necessity of sustainable agriculture for the life of next generations, they do not have adequate understanding about the good agricultural policies.

Table 3 shows 3,72 as the mean value of this subarea of agricultural literacy, which can be counted as moderate level. Careful examination of questionnaire items 5,6,8,12,13 imply the fact that almost all participants, (26 out of 30 participants) believe that all individuals in society need to have an adequate understanding about the agriculture and its effects (item 8). They also mostly (28 out of 30 participants) believe the necessity and importance of sustainable agriculture for the life of next generations (item 13). This results show that participants hold desirable beliefs about the importance of agriculture and its effect on the lives of societies. But, participants' reflections to other items related to the same subarea, 5,6, and 12, imply their inadequacy in agricultural policy. Item 5 argues that a true agricultural policy requires widening the agricultural fields in order to increase the income of farmers. Only one third of the participants (11 out of 30) gave desirable answers to this item by emphasizing their disagreement with the sentence. Consistently, for item 6, which states that

industrialization has much more importance than agriculture for the societies, and item 12, which states that changing in society from productive to consumer ones, around two third (19) and half (16) of the participants gave desirable answers to the items respectively. Low levels of disagreements to these items support the information given in the assertion B above.

Participants' reflections to scenario two do not completely support the findings for item 5 and the assertion. Scenario two is about the strawberry fields that farmers would like to widen through the forest in their village. The question at the end of the scenario asks for the participants' ideas of taking forest into strawberry fields. The following excerpts represent participants' reflections.

"I am not sure….forests need to be protected. Without trees, there would be erosion and this will decrease the efficiency of the land… this also causes to lack of flora and animals… not good for the environment…" (P,5).

"…widening the land is not the only way to increase the production and income…using appropriate amount of chemicals and non-chemicals, and determining the type of good compost needed for the soil may help more than increasing the size of the land…" (P,12).

Participants' reflections for the question display that widening the agricultural fields is not the way to increase the income of the producers. The amount and type of chemicals and compost might help more than widening the area. It is good that in their reflections, participants were aware of the important balance between agriculture and the environment. The issue is presented in the next assertion C.

Assertion C: Agriculture's relationship with the environment and natural resources

Prospective elementary science teachers, participated in this research study, have adequate understanding about the agriculture's relationship with the environment and natural resources. But, although they define animal husbandry as included in agriculture, they do not count fishing as part of it.

The agricultural literacy subarea mentioned in the assertion above, is represented with items numbered as 1, 2, 3, 4, 13, and 14 in the questionnaire. Mean value for this subarea is listed as 4, 00 in table 3. Research participants' had desired reflections for items listed above, except for item 14. Therefore; they have adequate level of understanding and knowledge about what agriculture is and how it effects the environment and natural resources by giving desired responses to items asking duty of an agricultural expert (29 out of 30 participants), genetically differentiated organisms and their effects on the environment (22 participants), and necessity of sustainable agriculture (28 participants).

Item 15 in the questionnaire defines agriculture as an area including animal husbandry. Almost all of the participants (26 of them) reflected to this item in a desired way. Although it is the case, research participants did not count fishing as animal husbandry and responded item 14 in mostly undesired way (18 out of 30 participants). That is, more than half of the participants think that fishing by trawls does not negatively affect the sustainable agriculture. Scenario 3 focuses on fishing by trawl and its effects on the environment. Participants' reflections to question at the end of scenario 3 imply that they do not appreciate trawlers. The following excerpts display that issue.

"…the purpose of fishing is to protect the sources not destroy them..I think trawl does it..I mean destroy it. Kind of trawl is also important in fishing..but anyway the fisherman needed to protect the resource he used…" (P,24).

"…using trawl…cause the change in ecosystem I think…which [change in ecosystem] is not good. Trawl takes the eggs also and this makes lack of fish in long run…" (P, 16).

Although research participants very well know that fishing by trawl is not good for the environment and ecosystem, they do not make the connection with sustainable agriculture. Therefore, participants need to revisit their definition of agriculture. Theoretically they may define it as in item 14, but scenario 3 reflected that they do not practically integrate husbandry to agriculture.

In conclusion; prospective elementary science teachers' knowledge and understandings about agriculture and its effect on the environment and natural resources seem at the moderate level according to the questionnaire used to determine the issue. The qualitative part of the research study underlines some inconsistencies like the one mentioned above. Participants' moderate level of agricultural literacy is not a case specific to our country. Hubert, Frank, Igo (2000), reported some research studies and underlined the fact that as countries develop and move to more urbanized societies, individuals' basic knowledge and understanding of the natural environment and its interrelated systems appears to have declined. Therefore; as part of the curriculum in elementary science, there needs to be courses focused on agriculture in relation with science education for prospective science teachers

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DEVELOPING A PROTOTYPE OF A LIFE SKILLS BASED FLIP BOOK GAME FOR EDUTAINMENT OF ADOLESCENTS IN RURAL TEEN CLUBS OF INDIA

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ABSTRACT
In India the Ministry of Youth Affairs and Sports engages rural youth in national development activities through the Nehru Yuva Kendra Sangathan. Adolescents are organized into Teen Clubs. A review by UNFPA (New Delhi) found that Teen Club members needed to be given new opportunities to engage them in an interactive way, impart relevant age appropriate information and develop life skills to enable them to make informed decisions and be responsible citizens. Department of Development Communication and Extension, Lady Irwin College, University of Delhi (India) was assigned a project to develop the prototype of a game for Teen Club members. A colourful flipbook game with pull out panels and informational Fact Sheets was designed in an innovative format. The game leads adolescents into several creative activities at the end of a gaming session. The game was finalized after field testing in Teen Clubs of villages in two states of India. It was highly appreciated by the adolescents, village elders and the field staff of Nehru Yuva Kendra Sangathan in both the states as a media for 'edutainment'. This game can serve as a template to develop several other forms of learning materials in print or digital format.
Key Words: Game, Adolescents, Life skills, Innovation, Edutainment

INTRODUCTION

Adolescents constitute a large section of India's population. Adolescence is a period of transition from childhood to adulthood marked by perceptible physical, social, psychological and emotional changes. These changes bring them a sense of curiosity, adventure and experimentation. Therefore they become susceptible to peer pressure and risk taking. They also face a number of questions related to the growing up process.

Lack of an appropriate space and opportunity to get the correct information makes the adolescents look for answers to their questions from either their friends or peers or from the media. The information they receive from these sources may not be accurate or adequate making adolescents vulnerable to risky behavior.

Therefore it becomes imperative to reach out with information on growing up and enable them to make informed choices in real life situations. This will also enable them to realize their potential and raise their health status. Further, adolescents also comprise an important part of the reproductive age group and are expected to play a significant role in determining the future size and growth of the country's population. With the increase in age of marriage, increased mobility and negative peer pressure, adolescents become vulnerable to unsafe sexual behavior.

Provision of accurate information, an enabling environment and supportive services can empower adolescents to make informed decisions regarding their health and personal safety, thus contributing to their overall well being.

Presently UNFPA (New Delhi, India) is providing assistance to "Support the Adolescent Health and Development" Project being implemented under the Programme of Collaboration with the Ministry of Youth Affairs and Sports, Government of India for Teen Club members of Nehru Yuva Kendra Sangathan (NYKS). Under the project, Teen Clubs have been setup in several Districts across nearly all the States of India for creating a space for adolescents to meet and share experiences. UNFPA's experience of engagement with these Teen Clubs indicated that they need to be made more vibrant and that activities should be made more interactive and interesting to sustain the interest of the adolescent members.

It was concluded that in order to make learning more interesting in the Teen Clubs, the activities that were presently being conducted in the Teen Clubs needed to be revamped. There was a need to develop material that promoted life skills through experiential learning among the Teen Club members. A game was identified at the most appropriate media to achieve the desired objective. Further, it was decided to explore the concept of 'engaging youth (University post graduate students specializing in development communication and extension) to prepare a prototype game for youth' (Teen Club members).

The Department of Development Communication and Extension, Lady Irwin College (University of Delhi) undertook the assignment of developing a prototype of the above referred life skills based material in the form of a Flip Book Game for adolescents. The project was sponsored by UNFPA (New Delhi, India).

OBJECTIVES

1. To design a prototype of a life skills based game for adolescents in Teen Clubs.
2. To field test the game with Teen Club members.
3. To reflect on the model of 'engaging youth (university students) to prepare a game for youth (rural Teen Club members)'.

GUIDELINES FOR PREPARING THE GAME

The Game was prepared keeping in mind the following premises:

- young people should themselves be involved in designing the activities and the prototype material for young people,
- Learning should be fun and edutainment based,
- young people should be able to relate to information and graphics to ensure accurate learning and build on their experiences,
- game session should enhance life skills,
- there should be an element of challenge and discovery in the activities and outcomes,
- a gaming session would involve participation of a group of adolescents at one time,
- the activities and outcomes should be based on issues and themes that adolescents are comfortable with and choose willingly,
- each activity would generate discussion and clarifications on issues and themes selected, and
- the game should be simple to play, easy to handle and maintain and low cost. It should be easy to send to remote parts of the country. It should be able to withstand frequent handling.

PROCESS OF GAME DEVELOPMENT

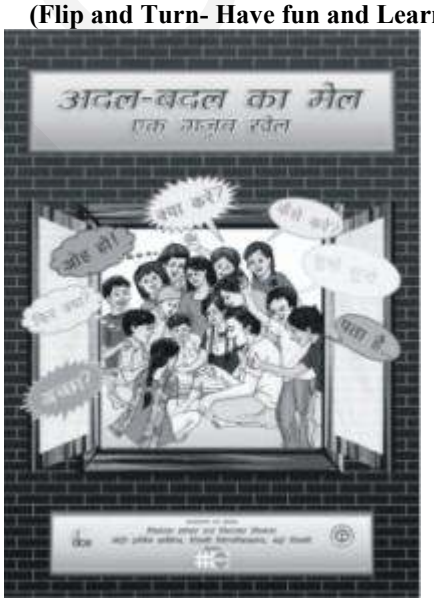
The Game development team comprised of fourteen postgraduate students specializing in Development Communication and Extension under the supervision of two faculty. The game was a result of three months of intensive efforts of the entire team.

Following is a brief description of the methodology used for developing the Game.

- Students were briefed about the project, time plan and its outcome.
- The entire project was divided into tasks and sub tasks and students were assigned these keeping in mind their interests and skills.
- Several brainstorming sessions were held to finalize the format of the game with students, Resource Persons and illustrator to research and review the different formats possible. It was decided to avoid game design in the form of playing cards or a board game with coins, tokens, markers or dice and other small parts. As a loss of any one part would make the game useless. Therefore, a flipbook format using a story telling approach was found most appropriate. The game was designed in the form of eight panels cut horizontally with the two central panels with pull out option to add more characters into the game. The panels were to represent a location, an issue and several characters.
- The group identified a series of illustrations by reviewing existing games, books and internet. Visuals representing rural lifestyles in India were listed for further review and selection keeping NYKS Teen Clubs in mind.
- A number of artists, book designers and publishers were identified through online search and personal contacts.
- Sample illustrations were invited from them and their previous projects were reviewed. One artist and one printer with computer aided graphic designing facilities were finalized.
- Brainstorming sessions were held where the project team screened the various illustrations and short-listed several characters and locations in a village. These were then described to the illustrator for designing. Emphasis was laid on making the illustrations very simple and realistic. Focus was to be laid on showing the facial expressions of each character to convey at first glance emotions like happiness, fear, anxiety, anger, curiosity, interest, humor, sadness etc.

- The locations selected were from common places that adolescents are likely to visit in and around their village. These include a farm, training centre, health centre, bus stand, village fair, pond, class room, health centre, approach road, a house, a lane, etc.
- As it was decided to use minimal text in the game emphasis was paid to individual expressions of each character so that the characters could speak for themselves.
- Dialogue bubbles were inserted with questions marks, exclamation marks and dots to give visual cues to adolescents and motivate them to fill dialogue boxes with their own comment, experiences and observations.
- Six detailed Fact sheets were prepared on key issues of concern for adolescents: (1) Life skills, (2) Physical changes in adolescent boys, (3) Physical changes in adolescent girls, (4) Behavioral and emotional changes in adolescents, (5) HIV and Aids and (6) Substance Abuse. These Fact Sheets contained all the important and useful information that is required to be disseminated amongst the adolescents on the issues in simple spoken English first. Initially the fact sheets were developed in English. Books and web sites were referred to ensure the adequacy and accuracy of the contents. To further supplement the information, reference material for the Fact Sheets was also collected from: UNFPA, WHO, UNICEF, NYKS, Niranter, National AIDS Control Organization and Hindi (the local language) books in Home Science. The Fact Sheets were translated in Hindi.
- Visuals of various characters and locations were identified and communicated to the illustrator.
- A draft Flip Book Game was prepared on the computer using original illustrations and Fact Sheets along with the instructions for playing the Game.
- The draft game developed was field tested by the 14 students and faculty with adolescents of NYKS Teen Clubs from villages in two states- Haryana (Sirsa district) and Rajasthan (Udaipur district). To take feedback of the Teen Club members two questionnaires were prepared. One inquiring about the opinion of the adolescents about the game and the other on the information contained in the Fact Sheets.
- Findings of the field testing were incorporated in the Game.
- The final prototype Game was discussed with experts and, approved by the team and there after designed and printed.
- All the students formally submitted the game to UNFPA (New Delhi, India) along with a project report in February 2010. They made computer presentations and performed role plays to share their learning from the project.

CONCEPT OF THE GAME: '*ADAL BADAL KA MEL- EK GAZAB KHEL*'
(Flip and Turn- Have fun and Learn)



This game has been designed for adolescents to engage them in an information sharing and learning process using an interactive approach. Through this game adolescents can discuss and analyze their growing up issues and concerns in the context of life skills required to negotiate this phase of their life.

Format: The game uses a flip book format in which adolescents are required to form a group, select a leader, select some characters, places and issues from various colored panels and pull out strips in several combinations. Adolescents are required to determine the behavior and actions of these characters in the context of the overall situation or scene that emerges in reference to the issue selected. They are subsequently encouraged to share their experiences regarding the situation and initiate a discussion on the same. They may also together make stories, write poems, perform puppet shows or enact role plays on the basis of the discussions on the issue.

An element of challenge and discovery has been built in the Game by incorporating pull out panels which enable the players to add new characters and places. This can further help in building up the discussion and story. The characters are placed in 'windows' and the game layout promotes the players to peep into the lives of other people and think about what they could be saying, doing, thinking, feeling, etc in the context of the situation and issue selected.

The game encourages adolescents to think, to recall their experiences, identify characters with their roles, freely expressing their own views and opinions about people, places and issues, to imagine and find relations amongst the various elements of a situation. The discussion process in a group inculcates traits like communication skills- verbal, and non-verbal (listening, thinking, etc), interpersonal relations, team spirit, leadership and negotiation. Used in this manner the Game helps the adolescents in developing an understanding of the issues and people's behavior and reactions regarding the same.

Fact Sheets: Fact Sheets are enclosed at the end of the Game to provide information on selected issues in simple spoken Hindi without unnecessary jargons. Adolescents can read these aloud in a group to facilitate understanding by all in the right perspective. The Game has been designed in a way that it can be used by adolescents not only in a group but even when they are alone.

Record Forms: A one page Record Form was enclosed at the end of the game. At the end of a gaming session the game leader is expected to use the Form to record the attendance of the Teen Club members, the issue, characters and locations selected, experiences, discussion points, stories generated by the players.

FIELD TESTING OF THE DRAFT FLIPBOOK GAME

For the field testing of the prototype Flip Book Game the group was divided into two, each group had 7 members. Field testing was done at two sites- Sirsa district in Haryana and Udaipur district in Rajasthan over a period of three days in November 2009.

Field testing at Sirsa district in Haryana State

The field testing was conducted at three identified sites namely, Government School at Bapp Village, a private school at Bapp Village and a NYKS Teen Club at Khera Kalan village of Sirsa District in Haryana. NKYS District Sirsa Coordinator introduced the team to the teachers, students and trainers. All children were from the local community.

At each village field testing began with a short introduction about the purpose of field testing of the game. All the adolescents were divided in groups of 15-20 students and were requested to sit in a circle, facing each other. The flip book game was handed over to them and one of these adolescents was asked to read out the instructions of the game in the group. As part of the game, each group had to identify a group

leader. Leader was asked to read the instructions carefully and explain the game to the participants. It was observed the concept of game was new for the adolescents and required some guidance in terms of how to play.

The adolescents selected some characters, a location and an issue. After the selection of issue, they were asked to build up a story or carry-out a discussion on the issue by sharing their experiences. They were also suggested to use Fact Sheets appended at the back of the game for reference. Issues like emotional changes in adolescence, substance abuse and physical violence were selected for the game.

Once the discussion was over, the group-members were asked to build stories using the selected characters and locations on the topic and reading information from Fact Sheets. Some of the groups were able to make good stories whereas some were not able to relate well as they wanted to play the game once more. With support from project team members, all groups were able to build up a story line. Each of the group found this game new, innovative and interesting. At the end of a session, the adolescents were given a questionnaire schedule to give their feedback on the game.

Field testing at Udaipur district in Rajasthan State

Field testing was carried out in Rundera Village of Udaipur with nearly one hundred and twenty adolescents. On first day, field testing was carried out with nearly sixty adolescents from two Teen Clubs. Each group was taken to a separate room to field test the game. The first group selected Physical Changes in boys and girls as an issue for playing the game. Both boys and girls sat separately for playing the game. The second group selected Emotional and Social Changes and HIV and AIDS as the topics for playing and discussing. In this group both girls and boys sat together for discussion. All the five topics were field tested with both the groups.

On the second day, one hour session was taken with another Teen Club which had around sixty teenagers. In this session, a brief introduction about the game was given and they were asked to select any one issue. A group of adolescent boys and girls together performed a role play on substance abuse and then a small discussion was held on this issue.

The Title of the game '*Adal Badal Ka Mail- Eak Gazab Khel*' (Flip and Turn- Have fun and Learn) was found to be very appropriate and appealing by all the adolescents at both the field testing sites. The adolescents could easily identify all the locations shown in the game. The visual of mela (village fair) was liked the most. New visuals of a classroom, teen club meeting under a tree and party scene were suggested by the Teen Club members. The adolescents found the game very interesting and the Fact Sheets very useful. They wanted to keep the game to explore it further.

Few Adolescents wanted information on issues like: nutrition during adolescence, reproductive health, superstitions prevailing in the society, hygiene and sanitation, importance of education in the family, communicable diseases, etc.

A few adolescents suggested that the information and knowledge given in the game could be used in making their folk songs, and short films which they could further share with others. Through puppets they could make stories, which was also an innovative idea to use this book.

REFLECTIONS ON THE MODEL: 'ENGAGING YOUTH TO PREPARE COMMUNICATION MATERIAL (FLIPBOOK GAME) FOR YOUTH'

The concept of engaging youth to prepare a flip book game for youth (adolescents of NYKS Teen Clubs) was very successful. This model can be replicated in future projects.

The post graduate students (specializing in Development Communication and Extension) had ample previous experience of designing and using similar communication materials. They immediately understood the project outline given by UNFPA. The project team could prepare the structure of the game in the first fifteen days of the project. The field experiences of the students during their academic course work had given them enough understanding of grassroot communities. With suitable guidance, they were able to prepare illustrations and Fact Sheets.

Field testing of the game helped the students to access the game designed by them in a practical and unbiased manner. The lacunae were easily attended to in the review meetings held after field testing the game.

The present format of the game is an outcome of experiences and insights gained by the students and faculty during the course of the project.

Other beneficial outcomes of the project for the students were:

- students were able to enrich their classroom learning and reinforce concepts by practical hands on experience,

- students were able to gain an experience of negotiating with project sponsors, experts, commercial illustrators, book designers and printers,
- students gained expertise in content writing and graphic design and computer aided designing,
- students were able to travel independently to visit rural areas and understand grassroot realities, needs and perceptions of the client group (rural adolescents),
- students were able to enhance their life skills, oral and visual communication skills, leadership problem solving, negotiation, decision making, time management and training skills,
- students were able to develop expertise as Master Trainers in explain the concept, purpose and correct use of the flip book game.

The role of UNFPA (New Delhi, India) in promoting this innovative flipbook game design and model of game development, having faith in the capacity and commitment of youth is path breaking and highly commended by the faculty teaching Development Communication and Extension at Lady Irwin College, Delhi (India). Such vision and far sightedness should be emulated and promoted by other development agencies.

RECOMMENDATIONS AND BEST PRACTICES FOR FUTURE PROJECTS

- The format of preparing a flip book game with eight cut-panels and pull-out panels was very new and innovative. This format offered the option of making innumerable new combinations of the panels for the players. This made every game session new and exciting, thus reducing boredom and fatigue. Further the game could have several outcomes (stories, poems, songs, plays etc.) as per the choice and creativity of the players.
- The stories prepared by adolescents during game sessions could be converted into short plays, posters, comics, poems and films. They could be encouraged to perform their plays as street theatre or puppet shows in their community on special occasions. This would give them a forum to express themselves, share their experiences and talent with a wide audience.
- Existing visuals can be used to prepare other self learning material to disseminate information to the adolescents. These may include: Playing Cards, Board Games, Flip Books (in other innovative formats), Flash Cards, Information Cube/Dice, Floor Games (on flex material). Book Marks, Calendars (different formats) and Stickers with key messages can be prepared. Digital stories and Comics (in Wall Poster and Booklet formats) can be prepared based on the stories generated by the adolescents. Interactive Computer and Mobile Phone Games can be designed using the same visuals to offer another platform for the adolescents to engage.
- The game can also be developed in the digital format using a multimedia approach through computers, mobile phones and internet. The advantages and appeal of ICTs can be drawn in the e learning and m learning mode with far reaching prospects in a quick and cost effective manner transcending the boundaries of class, caste, gender, income, regional and geographical barriers.
- Similar games can be made on issues like communicable diseases, health and sanitation, government development programmes and services, etc.
- Selected NYKS Teen Club and Youth Club members should be trained as Master Trainers and facilitators to train other young members in the correct method of playing the game. This would enable adolescents to derive maximum learning out of the game. Thus, fulfilling the objective of edutainment.
- The game can be used as a template and translated in other languages to reach adolescents, youth and adults all over the country and beyond.
- The concept of 'engaging youth (university graduates) to prepare a game for youth (adolescents of NYKS Teen Clubs)' was very successful. This model can be replicated in future projects.
- The Game can be used as an innovative and appealing self learning material for students studying in distance education mode. With some design modifications, the game can be made on many topics from the course work in different subjects offered by the open school system. These students can set their own pace for playing, learning and clarifying concepts in a stress free environment or in the privacy and comfort of their home environment at their convenience. They may be encouraged to involve their family and friends in a game session.
- In print format it can be put in mass circulation in a cost effective manner. It can be used as an activity with groups of students during Contact Programmes under the supervision of a Counselor. It can encourage them to introspect, speak up, share experiences, listen to others, clarify fact, remove misconceptions and at the same time engage in creative activities to promote learning.

DEVELOPING ONLINE ELT TRAINING PROGRAMS IN HIGHER EDUCATIONAL INSTITUTIONS OF GEORGIA

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Abstract

Online teaching and learning is gaining popularity very rapidly, consequently online teacher training courses are widely used to advance the quality of English language teaching throughout the world. The paper deals with the research conducted in Georgia to find out the attitudes and disposition of pre-service and in-service teachers towards online courses in comparison with traditionally delivered courses. Data collected during the study showed that teachers have positive perception and attitude towards online education and professional development. Their satisfaction with online learning environment is strongly related to several factors, such as: the amount of active interaction with other learners, the opportunity to enhance their professional skills at an accelerated pace and relatively low cost. The study addresses, identifies and provides examples of multiple variables that can influence students' online learning experiences. These include prior experience with computers, peer interaction, teacher/student interaction and instructional support. The article sums up the survey results and provides guidelines and recommendations for educational instructors in Georgia to create effective online teacher development course for pre-service and in-service teachers.

Key words: distance education, online teaching, Web-based instruction, teacher development

Introduction

Development of internet-based technology has brought challenges and new opportunities to education and training, in particular through online instruction. For many, this type of instruction is perceived as a major breakthrough in teaching and learning because it facilitates the exchange of information and expertise while providing opportunities for learners in distant or disadvantaged locations (Aragon, S.R. et al, 2001). Online instruction has emerged as an alternative mode of teaching and learning. The number of distance education and training courses is increasing worldwide and ELT online courses are gaining more and more popularity. There is a great demand on training and retraining of ELT teachers. The need for skillful English language teachers has increased in Georgia as the Government and State Policy emphasized the importance of teaching foreign languages and in particular English language in schools. The ELT programs offered by education faculties of Georgian Higher Educational Institutions are mainly maintained in conventional way. The studies conducted in different countries prove that online training programs are more convenient and have a number of advantages over the traditional teacher training. The main reason of the popularity of online teacher training courses is the busy schedule of in-service teachers. Using this mode of training they can develop professionally and "get what they need, when they need it, in a way that is accessible to them". In line with professional development in computer-assisted language learning (CALL) environments, language teachers need to understand instructional aspects of the Internet and know how to use Internet effectively for teaching purposes. Our aim was to find ways how to integrate web-based teacher training into a formal professional development course for language teachers and provide guidelines and recommendations for creating effective online teacher development courses.

Problems of the research

Educational administrators, teachers, and public need to know that online distance training is a valid and proven instructional method. They also need to know what to expect when planning, operating and teaching/ learning in an online course. Educators need to ensure that the quality of instruction is not overlooked, as well as address such issues as students' attitudes and perceptions of online instruction and how these issues may or may not influence their motivation and achievement in a course. Online teacher

training is absolutely new in Georgia and there has been no study conducted in this field. On the other hand, the demand for online training is increasing especially after some of the teachers participated in online courses offered by foreign projects or universities. The very first opportunity provided to Georgian teachers of English is ETTO – an online teacher training course, which has been designed and initiated by the ELT experts in the British Council Turkey office. The course virtually connects teachers from the Black Sea region – Georgia, Turkey, Armenia, Azerbaijan and Ukraine. This completely innovative project, that gives Georgian teachers opportunity to improve their practical teaching skills through online programs and assignments, began in 2009. 19 teachers completed the course in 2009 and currently 48 Georgian teachers are participating in it. Some Georgian teachers have also done online courses in different American and European universities.

Methodology of Research

Teachers enrolled in ETTO and other online training courses were the main population of the study. We have examined two sources of information collected over four month time period. These were the reflections written by some of the teachers who participated in ETTO and survey which included 12 close-ended items emailed to Georgian teachers of English (approximately 70) who have done any (at least one) online teacher training course. We have identified several variables that can affect students'/teachers' attitudes and perception of online instruction as well as the quality of the course itself. The variables included teaching methods, instructional support, peer interaction, student/teacher interaction, and prior experience with computers.

Results of Research

The results of the research proved that the perception and attitude towards online teacher training courses are positive. Many conditions support the need for distance learning. Teaching methods used in online courses foster learner centered approach, teamwork and cooperative effort. The respondents evaluated each of the items in the questionnaire either good or very good, only some of the respondents evaluated a few items as average. One of the questions was the participants' prior experience with computers to state the correlation between the experience with technology and course satisfaction and success.

Teaching methods

Online education is widely accepted as student-centered education. The learner decides when, what and how to learn. While the instructor can provide the environment for a collaborative and interactive learning experience, the learner is ultimately in control (Hura Gerri, 2008). The courses investigated in the study are asynchronous, where the learner is completely independent. The role of an instructor in online education has become more of a facilitator than a traditional professor. The role of the virtual instructor is to select and filter information for student consideration, to provide thought-provoking questions, and to facilitate well-organized discussions (Kettner-Polley, 1999). One of the objectives of the study was to find out relationship between teaching methods of online courses and learner achievement. All the interviewees indicated that teaching methods were the main factor that highly stimulated their interest.

Prior experience with computers

In order to enroll in any online course candidates need to have experience with computers, including MS Office, navigating the Internet, using emails to send, receive, attach or download messages and word documents. Some teachers in the study had additional or advanced skills in using different software. The teachers with less experience with computers had problems in the course, especially at the beginning. More skillful teachers tended to be supportive and helpful towards less experienced peers. On the other hand, participants with advanced technology skills proved themselves as more creative and in most cases had better results. The data collected for this study appears to support notion that students' prior experience with computers can boost positive performance of online learning, as noted by other researchers (Huang, 2002).

Peer Interaction

One of the main factors that determine students' satisfaction with online learning environment is the amount of active interaction with other learners, noting that different group activities, assignments, or projects can stimulate learning motivation. Creating a safe learning environment through positive social relationships can support these interactions (Ivers, K. S. et al, 2001). Data collected during this study supports this notion. This positive attitude towards peer interaction was described in teacher reflections collected for the study. Their special favorites included social posting threads, group assignments, group discussions, chats and face-to-face meetings.

Everybody emphasized the importance of relationships between the participants and participants and instructor, sharing experiences, ideas and prior knowledge. A very strong social network was built among the teachers and this is still maintained via private emails. In spite of the fact that positive interactions and relationships may contribute to learners' satisfaction toward online learning, only half of the teachers interviewed stated that the most meaningful learning came about through their interaction with others. This result supports the idea that collaborative interaction among students does not necessarily increase learning achievement. The results of the study can not be generalized because the teachers were not selected as representative sample, but our aim is to indicate the importance of peer interaction while creating a teacher training course. It is obvious that only interaction with peers can help to develop a sense of community that itself determines the interests and motivation of learners.

Teacher/Student Interaction

Success of online courses is linked with teacher (instructor)/student interaction. While online education is learner centered the role of the instructor still seems very significant. Participants of the study noted that challenging, motivating tutors increased their interest. The timeliness and the quality of the feedback provided by the instructors seemed vital as well. It is worth mentioning that generally teachers' perception of instructors' contribution to and involvement in online courses were positive. In there reflections almost all the teachers pointed the importance of feedback in online programs. In Georgia learner-centered approach is considerably new as in most post Soviet countries. In traditional teacher-centered approach learners were not encouraged to work more actively and cooperatively. The results of the data show that teacher/student interaction increased the motivation of the participants. Instructors can positively impact students' motivation, course engagement and learning achievement in many ways. Brent Muirhead in his article 'Encouraging Interaction in Online Classes' cites Palloff and Pratt (2001) "the key to success in our online classes rests not with the content that is being presented but with the method by which the course is being delivered" (p.152). He states that instructors need to foster a secure online setting that affirms diversity of thought and critical enquiry into the subject matter. One of the aims of an instructor is to provide students with flexibility in order to make the learning experiences more individualized. Data collected also suggests that instructor has the crucial role to engage learners in the course. Positive feedback is encouraging and motivates them to learn more and to achieve even more.

Institutional Support

Data collected indicate that participants found the online delivery of the majority of the courses taken by them very appealing and extremely beneficial; in the reflections collected they connect the overall satisfaction with the course with the ease of navigation and institutional support (e.g. technical support, interface, etc.). This means that one of the most important issues while creating any online teacher training course should be adequate institutional support, otherwise participants can suffer from frustration and stress.

Conclusions and Recommendations

The data collected in the survey enables us to conclude that overall perception and attitude towards online teacher training courses is highly positive in Georgia. The experience of western universities and numerous studies conducted about online and distance education ensures that online teacher education should be integrated in traditional curriculum at education faculties of higher educational institutions. Administration and faculties of major universities in Georgia express their readiness to implement these challenges. Only collaborative course development process can produce online courses that implement new technologies effectively, provide adequate interaction among learners, and present an online curriculum that meets the criteria for quality online education. We plan to work collaboratively with

educational instructors, university administrators, faculty support staff and faculty peers to develop and administer meaningful online learning experiences for in-service and pre-service teachers with different learning styles and knowledge levels.

Table 1: Questionnaire items

If you have taken on-line teacher training courses, how would you rate for each of the following:
1. The course as a whole
2. The extent to which teaching methods stimulated your interests
3. Degree to which the course trainer encouraged you to interact with other participants
4. Timeliness of course trainer response to questions, assignments, posts
5. Relevance of required reading, activities and assignments
6. The degree to which communication components of the course (chat, discussion board, email, announcements, etc) added to the interaction between participant to participant or participant to course trainer
7. The ease of course navigation
8. The quality of your experience with the technical interface
Would you like to take an online course
From what location did (do) you access your course most of the time
Please indicate the extant of your agreement or disagreement with the following item: Online courses contribute to professional, educational, or personal development

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DEVELOPMENT AND IMPLEMENTATION OF A SOFTWARE FRAMEWORK FOR REGISTRATION AND PERFORMANCE EVALUATION OF UNIVERSITY STUDENTS IN A FLEXIBLE ACADEMIC ENVIRONMENT

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Abstract:
In university education, a flexible academic environment (FAE) is advantageous compared to the rigid one because of its ability to handle student friendly flexibilities. However, implementation of FAE is hindered by the challenges in maintaining the databases to keep track of the students' academic progress. These challenges can be overcome by designing and using systematic processes and software support. This paper presents the design and implementation of the processes, divided in to various phases viz. Pre – Registration, Registration and Post – Registration phases. The process of development and use of corresponding software modules viz. PReMO, ReMO, PRoMO using software tools such as MySQL, J2EE, JDBC, HTML, CSS, JavaScript etc., is also presented. It has been suggested that with suitable modifications, the presented processes/software support may be used to implement FAE in any university.
Keywords: Flexible academic environment, registration, performance evaluation, software development

1. INTRODUCTION

With respect to the registration and performance evaluations of university students, the current academic environments in the countries like India may be categorized in to (a) rigid academic environment (RAE) and (b) flexible academic environment (FAE). The RAE, because of its simplicity, has been prevalent in many of the universities even though it has several disadvantages due to its rigidity. In RAE, student after enrollment undergoes a fixed set of courses, term after term in accordance with a rigid framework, till graduation. With its rigidity, RAE does not provide any flexibility to students to (a) choose courses, teachers, timings, (b) repeat already completed courses (c) accelerate or decelerate program (d) with draw a course or substitute a course with another course (e)) transfer from one program to another program in the same/another tier (E.g.: another under graduate/graduate/ Ph. D program) (f) do another program in the same tier along with the current program (E.g.: a dual degree).

On the other hand, FAE offers a lot of flexibilities hence overcomes almost all the above mentioned disadvantages of RAE. While FAE provides a wide spectrum of flexibilities to students, it poses a lot of challenges associated with upkeep and maintenance of databases to (a) keep track of the courses being done by individual students (b) arrive at performance indices for every completed term (c) ensure transfers/dual degree/graduation requirements. These challenges are easily met when there is less number of programs/students/structured courses (SC) and other inter disciplinary courses OIC). For such a situation, a simple process aided by trained office staff shall be sufficient to implement FAE. On the other hand, meeting these challenges in the case of a university (with large number of programs/students/SCs and OICs) becomes a herculean task. This task can be simplified by designing systematic process and making use of a software support developed for this purpose. This paper presents an outline of the work undertaken for the design of process and development of software of support for effective implementation of FAE in a university, where the first author is currently working.

2. PERIPHERAL DESIGN OF PROCESSES

The peripheral design of processes encompasses (a) identifying key players responsible (b) developing important documents for implementing FAE (c) identifying the key processes for designing the entire FAE (d) identifying the key resources for development of software support.

In a more generic sense, the key players are the Administrator of FAE (AFAE), the facilitators and the students. While AFAE is responsible for conceptualization, development, maintenance of entire FAE, facilitators shall aid AFAE to implement FAE. The facilitators include (a) academic decision making authorities (b) officers/faculty responsible for implementing the decisions and to provide necessary advices to students (c) office staff. Students are end users of the entire FAE facility.

The three essential documents to implement FAE are (a) Academic Regulations (AR) (b) the master course list (MCL) with details on all the offered courses in the university; description, number of units, pre requisites for each course etc., (c) the timetable (TT) with details on teachers handling each course/sections and the timings etc. The AR contains the information on all the flexibilities that university intends to provide, associated rules and regulations etc. The MCL, once prepared is to be updated as and when new courses are floated. TT is prepared fresh before every term. For a detailed understanding on contents of AR and MCL, the readers may refer BITSAR (2010) and BITSB (2010).

The key processes for designing the entire FAE is "registration" during which the student "registers" for the courses (s)he wishes to do in a particular term. The entire process of blending all the flexibilities within the frame work of FAE revolves around this "registration" which is to be done at the beginning of the every term. "Detailed outline of registration" is as given in Figure1. Once the registration is completed, the registration data shall be the input for arriving at the performance indicators.

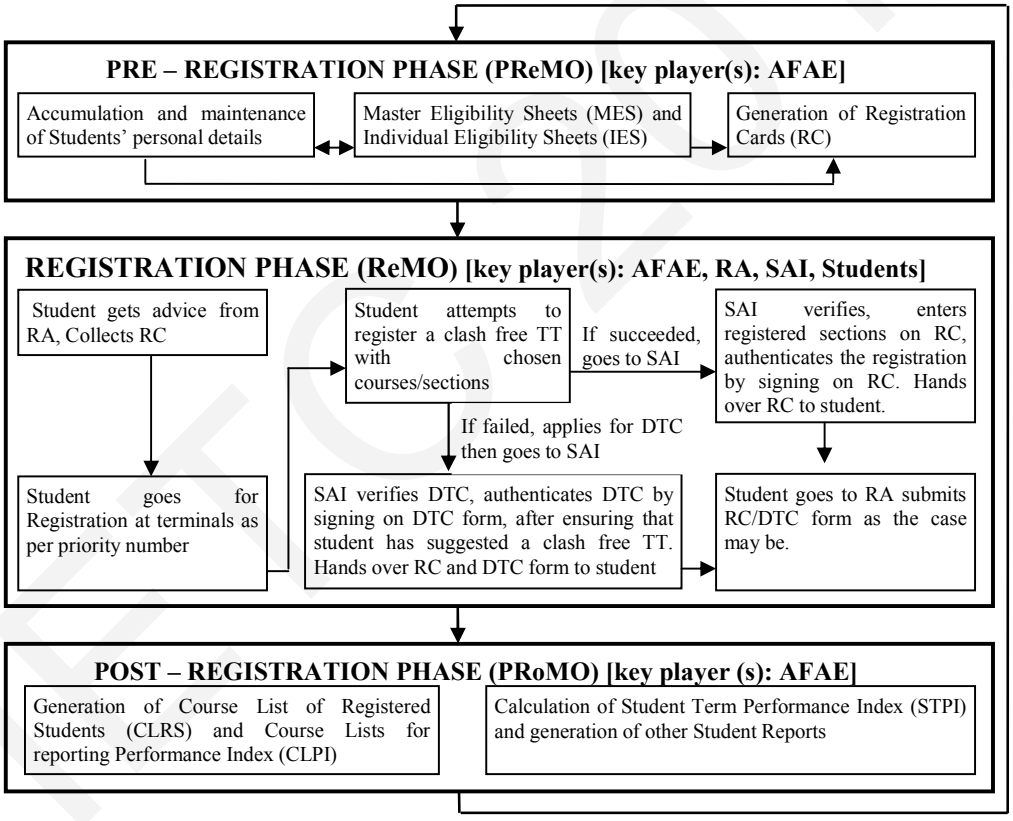

Figure1: Outline of various phases/modules of ReAPES frame work in FAE

While at the front end, registration is done by the student, at the back end, FAE should facilitate the entire process. This requires frequent, efficient and timely exchange of lot of data/information among all the key players/processes. In a university set up, where there are large number of courses/students/programs, software support becomes essential for this information exchange. For design & operational conveniences, these back end arrangements are divided in to three sub-phases namely Pre–Registration, Registration and Post–Registration phases with associated software modules as PReMO, ReMO and PRoMO respectively. With all the modules/phases together, the framework/software is called as Registration and Performance Evaluation

System, ReAPES. Figure 1 depicts the flow of information, the activities that are to be performed through various phases/modules of ReAPES. The process of software development may be outsourced to external professional software experts. However, it would be more appropriate to involve the interested faculty and students since (a) both are exposed to live challenges behind implementing FAE and (b) students have greater scope for learning.

The basic requirement to develop ReAPES is to develop a centralized database which captures all the data required by various processes. Database design is very critical as the entire performance of the software interface, a client server model, solely depends on the data retrieval time. Of all the available database management systems (DBMS), Relational Database Management System (RDBMS) is the most appropriate for the task in hand. Various open sources available to implement RDBMS are MySQL, PostgreSQL, Oracle, MS SQL etc. For the problems like the present one, MySQL is prominently used due to its advantages viz. (a) speed (b) robust nature (c) good feature set (d) higher reliability (e) higher portability (f) effective security (g) sophisticated privilege system (h) the wide variety of sockets which can be used to connect to the database and scalability. One additional advantage it carries is that it is a freeware. These advantages of MySQL outweigh its limitations associated with maximum size of table (8TB); maximum number of indices per table (32); maximum number of parts of columns in an index (16); maximum index width (500 bytes). For the development of user interface and programming logic implementation, MySQL is highly compatible with languages like J2EE, PHP. J2EE is widely used because of its scalability, reusability, security and it can be easily integrated with existing modules. PHP is another programming language which is no less than J2EE in either its features or in security provided. Besides these, HTML, CSS are also best candidates to develop user interface and JavaScript to incorporate the necessary validations. In the recent past, detailed descriptions on advantages, disadvantages and relevance of these tools for the problems like the present one are presented by Shudhalwar Deepak & Khanale Prakash (2010), Andy Oppel (2010), Chris Snyder et al. (2010), Gilbert Held (2010). Design of sub–phases/modules and the software implementation are presented in the subsequent sections.

3. DESIGN OF PROCESSES AND SOFTWARE FOR PRE - REGISTRATION PHASE

Pre registration phase refers to all the processes that are prior to the registration. This phase involves design and implementation of processes and sub module PReMO of ReAPES to generate and maintain (a) databases (b) eligibility sheets (c) registration cards. Salient features of these activities are presented in the following sections.

3.1 Accumulation and maintenance of Students' personal details

Students' details such as ID number of the student; the program in to which (s)he is admitted; name of the student; and other personal details like addresses, gender, date of birth etc., being the basic information required, a database is to be designed such that PReMO facilitates authorized personnel to enter/alter the details as and when required. Salient features of this module are as mentioned in Table 1.

3.2 Master Eligibility Sheets (MES) and Individual Eligibility Sheets (IES)

IES is a consolidated statement containing all the academic information of a particular student. It contains (a) all the courses the student has done so far along with performance index (PI) in each course; (b) the courses to be done (c) possible term in which the student is eligible to register for these etc. This necessitates design of MES for each and every program being offered by university. Based on these MES, IES shall be prepared at the beginning of every term. IES provides the basic input for generating the lists of courses to be offered in a particular term which in turn is useful in preparing the TT. A copy of the IES shall be given to every student before registration. ES module of PReMO is designed to generate and update MES and IES as and when required as per the AR and MCL governing the academic program(s). Salient features of this module are as mentioned in Table 1. The process flow is as follows. : 1. Enter ReAPES as Administrator; 2. Enter PReMO; 3. Enter ES Module; 4. Choose batch and discipline to generate IES for a group of students or Enter ID Number to generate IES for individual students; 5. Repeat step 4 as per the requirement; 6. Logout.

3.3 Generation of Registration Cards (RC)

Another instrument that is to be generated at the beginning of every term is RC which consists of the all the SC the student may register at the beginning of a particular term. This RC with provisions for signatures of all persons (including student) responsible in "registration", serves as the authenticate document with the AFAE regarding student's registration in that particular term. In order to provide equal opportunity for all the students to chose his/her choice of section(s)/course(s), registration is done based on a random number (called as priority number) generated and assigned for each student. This priority number and the student specific password to access ReMO are also printed on RC. Additionally, RC contains necessary provisions to record the amendments to the original registration which may arise because of withdrawal from a course or substitution of a course with another course. RC module of PReMO facilitates all these. Salient features of this module are as mentioned in Table 1. The process flow is as follows. : 1**.** Enter ReAPES as Administrator; 2. Enter PReMO; 3. Enter RC Module; 4. Choose batch and discipline to generate RC for a group of students who are eligible to register in that term (eligible students' list is obtained from designed database) or Enter ID Number to generate RC for individual students; 5. Repeat step 4 as per the requirement; 6. Logout.

Table1. Salient features of various software modules of PReMO, ReMO and PRoMO

Phase	Module	Input	Output	End users	Technology used
3.1	Database development	Student details	Centralized database	All software interfaces	MySQL
3.2	ES module	Student details and MCL	IES of all students (Printable document)	AFAE	MySQL, J2EE, JDBC, HTML, CSS, JavaScript
3.3	RC module	Student details	Printable word document of all RCs	AFAE	MySQL, J2EE, JDBC, HTML, CSS, JavaScript
4.1	RA module	Student details	Registration details	RA	MySQL, PHP, HTML, CSS
4.2	Student module	Student details and their eligible courses	Registration	Students	MySQL, PHP, HTML, CSS
4.3	SAI module	Registration details	Confirmed TT/DTC	SAI	MySQL, PHP, HTML, CSS
5.1	PI module	Details of registered sections	Students' lists of courses viz. CLRS and CLPI	Teachers of courses, AFAE	MySQL, PHP, HTML, CSS
5.2	STPI module	Students lists with PI's uploaded	STPI Reports/ printable word documents	AFAE	MySQL, J2EE, JDBC, HTML, CSS, JavaScript

4. DESIGN OF PROCESSES AND SOFTWARE FOR REGISTRATION PHASE

On the front end, Registration Advisors (RA), Section Allotment In charge (SAI) and students are the key players in Registration. The process is outlined in Figure 1. Sometimes the student might not be able to register to a clash free timetable when quotas of certain section/course are exhausted, which usually happens by the time almost all the students are registered. Such a case is termed as a Difficult Timetable Case (DTC). Such DTC are to be cleared by AFAE. Salient features of design of the processes and development of sub modules of ReMO are presented in the following sections. In view of the importance of the activity, even though the ReMO is made in to different sub modules viz. RA module, student module, SAI module, the AFAE shall have the administrative control over the entire ReMO. Hence the ReMO is designed to facilitate the AFAE to (a) have administrative access to all modules (b) add/delete the courses/sections and enter/modify the corresponding timings (c) enter/modify the quotas for courses/sections (d) deregister already registered student(s) (e) debar certain student(s) from registration (f) generate various reports with registration statistics.

4.1. Registration advising by Registration Advisor (RA)

RAs are the senior faculty of the university who are very well aware of the various eligibility clauses of AR, the breadth and depth of contents of the courses being offered in a particular term. With these qualities, RA plays the important role of advising the student on what courses (s)he can register for the term. In order to facilitate the better use of RA, the Registration phase is designed as outlined in Figure 1. In addition to the activities mentioned in Figure 1, RA, assisted by appropriate personnel, is also responsible to (a) keep track of

the RCs/DTC/unregistered students and (b) report these details/documents to AFAE. RA module of ReMO facilitates all these. Salient features of this module are as mentioned in Table 1. The process flow for RA to use this module is as follows. : 1**.** Enters RA module of ReMO of ReAPES using appropriate login and passwords; 2. views the list of allotted students for advising; 3. Chooses ID No; 4.Updates RC taken status after RC is given to student; 6. Updates the RC submitted status once the student submits back the RC; 7. Repeats 3, 4, 5, 6 till all the students are completed; 8. Generates reports; 9. Logs out

4.2. Registration by students

The student after collecting RC from his/her respective RA, has to register to a clash-free timetable for the term as per his/her choice of courses, teachers and timings. These courses may include SC, OIC that (s)he is eligible to register, already completed course(s) which (s)he wishes to repeat and so on. Hence student module of ReMO is designed to facilitate the student to visualize his/her eligible courses for registration once (s)he enters the ReMO. Since the software is required to give the corresponding and correct set of eligible courses for each student in a user friendly manner, this portion of the software development is very critical. The requirements to make student module of ReMO ready are (a) list of students eligible for registration with their ID No, name, password, list of courses being offered, list of sections for each course, their capacities. Salient features of this module are as mentioned in Table 1. The process flow is as follows. : 1. Student enters ReMO with ID No and the password specified on RC (The student shall be able to enter ReMO only after collecting RC from RA); 2. Student chooses his/her courses (s)he wishes to register(these courses are to be from a the displayed list of his/her eligible SC/OIC and repeatable courses); 3. Student chooses sections/teachers; 4. Depending on his/her requirement, student shall repeat 2 and 3 to get a clash free time table; 5. Student registers a clash - free time table if successful else applies for a DTC; 6. Student logs out

4.3. Students' registration/DTC verification by Section Allotment In-charge (SAI)

The SAI is a faculty member of the university. The role of SAI is as mentioned in Figure 1. SAI module of ReMO facilitates all the activities to be done by SAI. Salient features of this module are as mentioned in Table 1. The process flow for SAI to use this module is as follows.: 1. Enters SAI module of ReAPES with appropriate login and password details; 2.Enters the ID No of the student when the student comes to him after registration; 3. Confirms the displayed TT/DTC registered by the student; 4. Repeats the steps 2 and 3 till all the students are completed; 5. SAI logs out

4.4. Clearance of Difficult Time table Cases (DTC)

The meaning of DTC is explained earlier and the process of applying for DTC is explained in Figure1. Taking the suggested sections as one of the inputs, the AFAE makes arrangements to resolve the DTCs without hampering other students' choices/preferences. This is done by (a) using various clauses /regulations of AR and or (b) adjusting the quotas in less sought after sections/courses. After the DTC is cleared student is allowed to register for clash free TT with suggested sections/courses. The registration process is same as that of regular registration. Registration of the DTC students is done immediately after regular registration.

5. DESIGN OF PROCESSES AND SOFTWARE FOR POST - REGISTRATION PHASE

The activities that follow the registration are (a) generation & distribution of registered students lists of each course (b) allowing for other flexibilities (c) collection/calculation/reporting of performance indices of registered students (e) generation of various end term reports etc. The generated indices/reports shall be the inputs for next term registration. Hence all the databases are to be updated as and when each of the above activities is completed. Salient features of design of the processes and development of sub modules of PRoMO, that facilitate the above activities are presented in the following sections

5.1 Generation of Course List of Registered Students (CLRS) Course Lists of Performance Index (CLPI)

Post – registration, the immediate activity is to generate the registered students' lists of all the individual courses, called CLRS. These CLRS of each course is used for regular monitoring of the course and hence

should be made available to respective teachers of the course. As per prescribed time schedules, the AFAE allows the students to make use of the flexibility of withdrawal/substitution of courses. Accordingly, the registration of individual student is amended, databases are updated, CLRSs are modified and are made available to all the concerned. At the end of the term, based on CLRS, CLPI are generated and are made available to the teachers of each course. As defined in AR, this PI could be marks/grade/report obtained by a student in that particular course. At the end of term, the teacher of the individual course shall fill in the PI column for each student with corresponding PI, and submit this filled in CLPI to the AFAE. All these activities are facilitated by PI module of PRoMO, salient features of which are presented in Table 1. AFAE uses this module to generate the lists and update the databases where as teachers use it to download and upload the CLRS and CLPI.

5.2 Calculation of Student Term Performance Index (STPI) and generation of Student Reports

At the end of term, the PIs of each student in all his/her registered courses are to be aggregated so as to arrive at STPI. This STPI could be a simple average of marks obtained in all the courses or a cumulative grade point average, CGPA. The method of calculating STPI should be clearly spelt out in AR. In addition to the computation of STPI, the FAE is to undertake the process of generating the student wise reports for STPI, student term performance card , STPC; student courses index for graduation, SCIG; student units' index for graduation, SUIG; student courses index for transfer, SCIT; student units' index for transfer, SCUIT and so on. STPC is a student specific report containing PI of each course, STPI etc. Other reports are also student specific and are to be generated to decide on the students' eligibility for graduation or to permit to use flexibilities like transfer. While STPC is distributed to the respective students, all other reports are used by AFAE for their intended purposes. Subsequent to this, the FAE should facilitate updating of student records such as IES with latest PI in all courses, STPI and other relevant data so as to make them ready for "registration" in the next term. All these activities are facilitated by STPI module of PRoMO, salient features of which are presented in Table 1. The process flow for AFAE to use this module is as follows:1. Enter STPI of PRoMO of ReAPES as administrator; 2. Chose a course; 3. Confirm the PI of individual students by reentering the PI of individual students in the courses; 4. Repeat the step 3 till all the PI entries are done for all the courses; 5. Evaluate STPI and all other indices either by selecting individual student or the whole batch of students; 6. Repeat step 5 till STPI is generated for all the registered students; 7. Generate STPC and all other reports either for individual student or for a batch of students; 8. Repeat step 7 for all registered students; 7. Logout.

6. Conclusions

Through the comparison between a RAE and FAE, it can be identified that FAE is more advantageous, especially for university education, since it provides opportunities for broad based learning in a student friendly manner. However, there are several challenges that are to be met to implement FAE in a university. As demonstrated in this paper, these challenges can easily be overcome by appropriately designing the processes and by developing software support using appropriate technological tools. With slight and suitable modifications, the designed processes and software may be used for effective implementation of FAE in any university.

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DEVELOPMENT OF A RELATIONAL DATABASE FOR LEARNING MANAGEMENT SYSTEMS

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Abstract. In today's world, Web-Based Distance Education Systems have a great importance. Web-based Distance Education Systems are usually known as Learning Management Systems (LMS). In this article, a database design, which was developed to create an educational institution as a Learning Management System, is described. In this sense, developed Learning Management System consists of basis of Virtual Education Institutions. In this study, a fully relational database design has been realized in compliance with SCORM standards and got ready to be used as Virtual Education Institutions. This system can be used for any required education institute and it can be run within the same interface. In LMS that will be generated, a faculty or institute can be defined and academic and all administrative processes of the defined institute can be managed with the designed system. Proposed database design has been used in a LMS of Afyon Kocatepe University. In this system, many processes like indexing, uploading, downloading, production and editing of web based learning materials can also be performed easily and safely.
Keywords: Distance Education, E-learning, Web-Based Distance Learning Systems, SCORM, Relational Database Design.

1. INTRODUCTION

In today's modern age, changes are observed people's life style. Development of mobile communication systems and mobility of the people play the most important role about this issue. People's daily activity programs are divided into many different type activities. The main concern in education is that how classical education institutions will establish education environment of increasing active population. The purpose of mobile education is to move today's stable education environment to a virtual, flexible education environment of the future [16].

Today, there is a growing interest in online learning all over the world [6]. Electronic learning plays important role not only in academic institutions but also in small and medium-sized enterprises, which have the will to renew knowledge and experience of their staff. E-learning provides practical solutions to the students, who did not participate in the past education processes [14]. At this point, scientists have emphasized on customization, interaction and control [13]. An e-learning program should be especially prepared for all students with the integration of different objects, past experiences and also these students should increase their own activities [4, 5, 9].

E-learning trusts in current information and communication technologies for distribution of learning contents. Learning process or its ambiance is organized according to either synchronous or asynchronous method. E-learning, which has been developed as a learning solution, represents the distance education with the flexibility of educational software and process covering synthesis of different technologies [15].

Increasing internet using rate and developments in the infrastructure of today's internet have caused many improvements in web-based software and services. As a result of these improvements, education activities have begun to be performed by using the internet and network technology. Many technological tools like electronic books, electronic mails and conference environments have also taken active parts in these kinds of education activities. Due to increasing rate in using these tools and related education methods, a special education system has appeared. The whole education system is called as "Web-based Distance Education System" (WBDES). Today, distance education systems are established in many universities and education-teaching activities are performed via these systems. One of the big reasons in increasing using rate of Web-based Distance Education is requirements to these kinds of systems in parallel with developments in the information technology.

One of the most important advantages of WBDES is being able to provide asynchronous education within a virtual education environment. In a WBDES, students can easily access to the educational contents, which was transferred by educators to the system and take advantage of these sources by using different educational tools. Because of its advantages on costs, WBDES is also preferred to be used rather than other models or systems [3]. Today, the most important reason in increasing the number of WBDES and to be

accepted by students is their independent working mechanism from time and location [2]. It has been an important preference reason for the people who suffer shortage of time and can not take active part in the location where education activities are performed. Generally, Web-based Distance Education Systems are called as Learning Management Systems (LMS). Factors and methods, which are considered in designing LMS, have been examined in the literature from various perspectives [7, 8, 11]. When they are evaluated in terms of cost, it is seen that the cost of WBDES is approximately half of a typical traditional and formal education cost. On the other hand, interactive education feature of WBDES and up-to-date content presenting function should also be considered [1].

In this study, a database model, which was designed and developed to be used for Learning Management Systems, is described. The database model was developed in a relational structure and designed to be suitable for LMS, which are in compliance with SCORM standards. Additionally, the developed model has a portable, easily accessible and easy-to-manage structure and can be used in long-term studies. With this database model, a virtual education institute can be established and published via required interface structures. In the related Learning Management System, a faculty or institute can be defined and all academic and administrative processes of these institutes can be managed with the help of developed database model.

2. SCORM STANDARDS

SCORM is a Content Management System Standard and can be defined as "Shareable Content Object Reference Model". SCORM includes a framework for running lesson contents. SCORM standards are interested in publishing rather than teachable features of the lesson content [10, 12].

While explaining the content management aspects of distance education systems, SCORM standards must also be examined in every respect. While applying SCORM standards, some factors, which belong to SCOM standards, must be stated. These factors are;

1. *Interoperability:* Merging contents from different sources for interaction and to be able to run in different systems and communicate with other systems.
2. *Re-usability:* The situation that defines re-usability for information and objects, which consist of e-learning content (script, graphic, sound, animation, video, code…etc.) and turning into a different education object, which includes all of these objects.
3. *Manageability:* Monitoring the information, which belongs to the user or content management system.
4. *Accessibility:* To be able to access a learning object at any time.
5. *Durability:* A technological development, which describes generating new versions for the tools requiring re-design and coding.
6. *Scalability:* Being able to change according to quantity of users, number of the technology, number of courses or content.

If SCORM standards are taken into consideration, the developed system or model can be used for a long time and updated easily. System or model contents can also be accessed easily from any location.

3. RELATIONAL DATABASE MODEL FOR A LEARNING MANAGEMENT SYSTEM

Database design is a detailed study, which must be overviewed plenty of times in the period of analyzing performance. Tables and properties of these tables must be examined in any module structure during the analyzing and designing process. Because of some processes like information filtering or information access, the database model should have an integrated structure. In every phase of the analyzing process, features and functions of a typical relational database must also be considered. Moreover, handicaps appeared by relation scenarios can jeopardize information integrity and also information security. So, these factors must also be considered.

Database structure of a typical distance education system presents a relational and complex structure. Different user types, authorization features and behavior rules also requires a relational database model. For instance, if a new user is added to the system, the necessary space, which this new user will need should be arranged automatically according to the user type. Different information depend on a user is kept in different tables like exams, personal information and course lessons in the distance education system. A relational model is also required to ensure a flexible model, which provides needed spaces for each new user added to the database. Congruently, the model can also remove related information and records automatically when a specific user is removed from the database.

MS SQL Server – Database Management System has been used in designing the LMS database structure. Before designing the database structure, an analyzing performance has been performed and structure of the education system has also been adjusted. At this point, the features, which will be needed in the LMS, are considered. Designed LMS system consists of 38 main modules and 153 tables. Each module includes an integrated sub table structure.

While realizing the association process, a semantic scenario among database tables has been generated and according to this scenario, 14 different associated groups were created.
These groups are: Application, Users, Financial Services, Workshop, Test, Menu, Academic Information, Chat, Group, Forum, Other Applications, Course, Demo and Survey

Each module in the system is an integral structure within itself. Additionally, a module is also an integral relation scenario at the same time. So, there is only one module in a provided relation scenario.

4. TABLES AND RELATION SCENARIOS

The first module of the developed model is named as the Application module. Users who want to benefit from the system (administrators, students or lecturers) take part in the database structure of this module. The Application module tables and relation scenarios are presented in Figure 1.

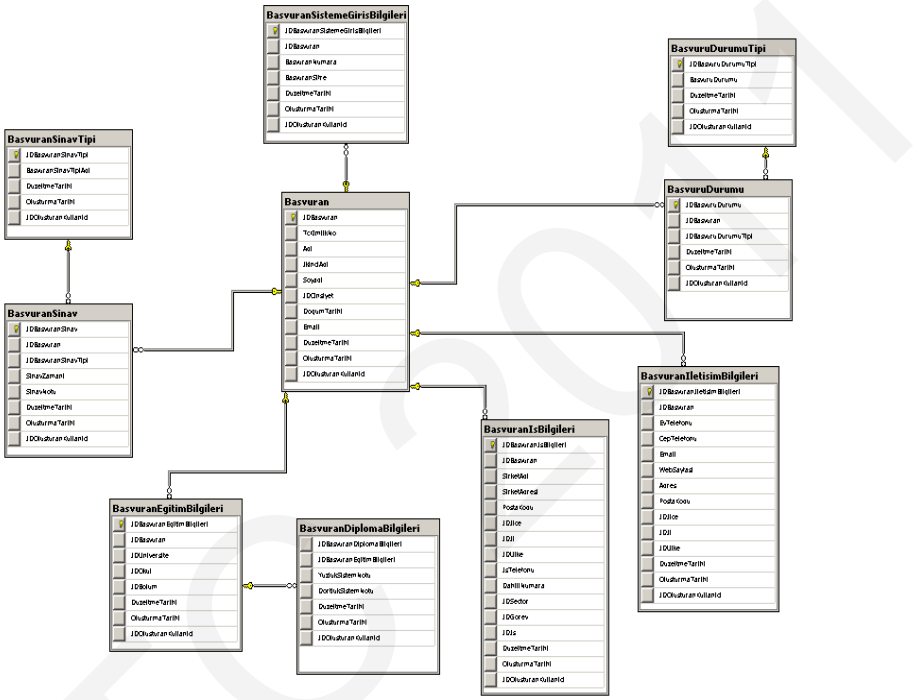

Figure 1. Application module tables and relation scenarios.

User tables relation scenarios are given in Figure 2. The user module is one of the most important modules of the LMS module. All necessary information about system users (from administrators to course students and lecturers) is stored in this module.

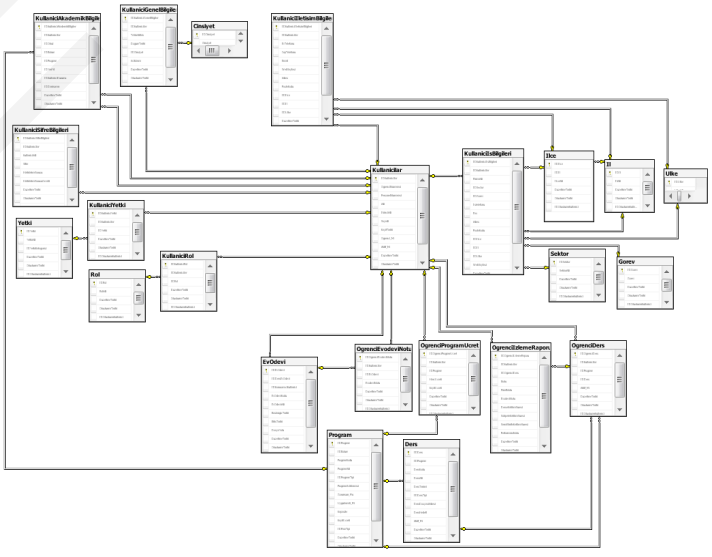

Figure 2. Users module tables and relation scenarios.

Financial transactions scenario and its LMS module are shown in Figure 3. In this module, students' registration fees, incomes from additional courses and basic expenses like financial transactions are tracked.

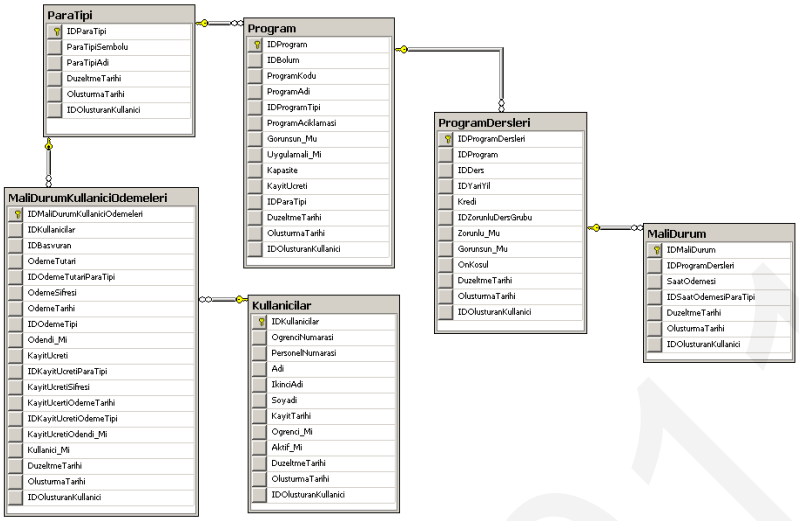

Figure 3. Financial services tables and relation scenarios.

Workshop module was developed to be used for course activities, which can be performed by visitor users. With this module, special education sessions like training seminars can be performed easily. For instance, a general “Photoshop” training can be organized with the help of this module. Users, who participate in this module, are evaluated in similar conditions with other course students. Workshop module and relation scenarios are presented in Figure 4.

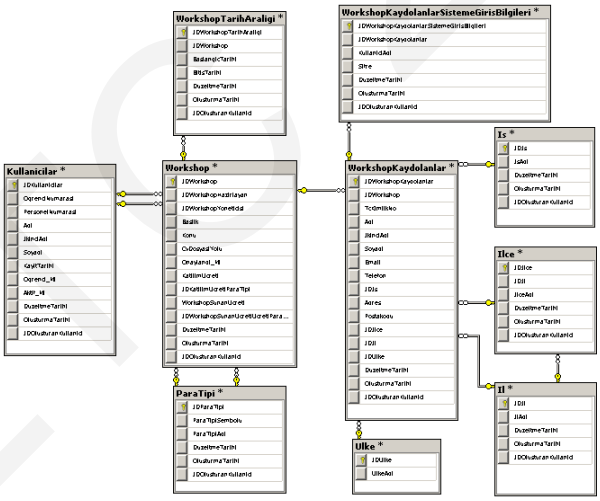

Figure 4. Workshop module tables and relation scenarios.

Exam module and relation scenarios are shown in Figure 5. The developed module is suitable to be used for special exams like visa and final examinations. As it can be seen from the table structure, various information like examination branch or class, examination type, examination date, examination starting and ending time, examination questions and examinations results can be stored in the database.

Menu structures, which can be seen by administrators, students and lecturers, are organized by using the Menu module and its database features. At this point, features of provided menu interfaces are changed according to the user type as “student” or “lecturer”. These menus are organized according to user roles and privileges. Due to the page restrictions about papers, other figures will not be given in the paper. In Academic Information module, a structure, which can be used by each education institute to fulfill its academic functioning, has been formed. With this module, different information like students’ personal information, registration details, system sections, branches, courses and payment information can be kept in a relational structure and many different actions associated with the mentioned information

can be defined easily. Chat module has been developed to ensure text-based and auditory conversation sessions among students and lecturers on specific dates and times. Only lecturers and students can perform chatting activities mutually.

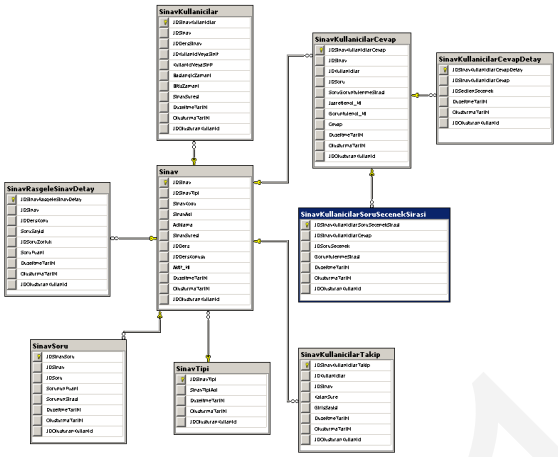

Figure 5. Test module tables relation scenarios.

In Group module, authorization descriptions and related functions are adjusted for the registered users. In this aim, new role or authority descriptions can be added to the system and authorization or role assignments can be performed easily for each registered user. It is also possible to define new user groups, which are allowed to access specific areas. A discussion forum has been consisted in to ensure information sharing among lecturers and students. This module is associated with the user login system and so each user can participate in information sharing activities at the same time.

LMS functions are not limited to only modules explained before. Many different modules are also combined under "Other Applications" tables and relation scenarios. Some of the related modules are: Personal Calendar, Academic Calendar, Transcript, Performance Tracking, News, Personal Notes, Dictionary, Virtual Classroom, FAQ, Private Message and Meeting modules.

Courses module is used for defining the courses, which will be provided in the system. In this module, some information about prepared courses (related course codes, descriptions for courses, course lesson contents…etc.) are defined easily. By using the Courses module, it is also possible to create different types of courses and define different features (course assignments, course examinations, descriptions for added course lesson contents…etc.) for the stored courses. Demo module was developed to be used for showing system features and functions to the people who are not fully registered and want to review the whole system. With this module, user can only examine using features and can not make any changes in the system. Survey module was developed to be used for performing survey activities in the system. With this module, it is possible to define survey questions and show them to user via system interface. Added surveys can also be removed automatically at specific times. Additionally, statistical information about added surveys can also be shown to users or just kept as confidential.

5. THE LMS APPLICATION

Designed database is currently used in a LMS developed at Afyon Kocatepe University. The LMS is named as Afyon Kocatepe University Distance Education Center (@KU-DEC). It runs efficiently on the web address: www.uzem.aku.edu.tr. It is not possible to explain the whole system features and functions here. So, it will be explained briefly. Developed LMS has all the features that a typical LMS must employ. The system allows creating a virtual campus easily and provides different activity environments for administrators, students and lecturers. It has a modular structure and so system modules can be added, removed or updated by using the provided tools. Each user has a username and user password to login to the system via login page. After logging in to the system, users can view Frequently Asked Questions (FAQ) section, explanations for using the LMS and an academic calendar provided on the homepage. Administrators have some authorities like creating entity, department or course and tracking both lecturers' and students' activities on the system. They also have authority to examine lecturers' and students' activity performances. Finally, administrators can also communicate with other users at any time as individually or collectively.

Lecturers can prepare weekly lesson contents and add new weeks by using the content preparation module provided in the system. Additionally, they can communicate with students via

synchronous and asynchronous communication modules, which can be used as text based, verbal and visual. They can also prepare surveys with the present survey module to take students' opinions about lessons. By creating question banks over the system, assessments like quiz and homework can be prepared and provided to students as online. In the system, students can join a course lesson, track both synchronous and asynchronous lessons and perform all kinds of activities based on office operations (transcript, school report, student certificate or identity card request…etc.). They can also communicate with administrators, lecturers or other students by using e-mail, forum and petition functions.

6. CONCLUSIONS AND SUGGESTIONS

In this study, a relational database model, which can be used within web-based distance education systems, is described. The developed model provides fully relational design, data integrity and security for large-scale Learning Management Systems. Relation scenarios was arranged to be suitable for a Learning Management System and got ready for a management system interface. The system has also been prepared in compliance with SCORM standards. Prepared database model is used in a LMS, which was developed to be used as distance education infrastructure of Afyon Kocatepe University (@KU-DEC). The developed system has been tested since at the beginning of 2009. Up to now, no disruption has been observed in both system and the database. Any educational institution, which uses this database design, can be integrated to the developed system easily. This function is helpful for especially researchers who try to develop a new LMS. In this way, wasting time on database analysis and creating education scenarios can also be prevented.

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INTERACTIVE DESIGN OF JAWI AND QURANIC COURSEWARE FOR PRESCHOOL - JQAP

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ABSTRACT

The design of Jawi and Quranic Courseware for Preschools (JQAP) is intended to assist preschool students in learning *Jawi* characters and basic, simple *Quranic* verses due to their ability and adaptation. This paper focuses on interactive design in this learning aid tool to create a motivated learning environment. JQAP is a self-access learning tool, aims to train children in independently learning, as well as to assist teacher in conducting and helping the children when needed. The aim is on the effort to fulfill variety of individual's need with supportive environment and learning condition. This approach is based on perception that only children can optimally accomplish it by themselves and determine the best learning strategy that suits him/her. Result shows that the respondents in this study have agreed with the presentation aspect and overall look of this product is able to attract children' attention to learn the *Jawi* script and Quranic verse using it. JQAP development is not only intended to upgrade students' skill in understanding *Quranic* verses, but as well as promoting the *Jawi* character heritance.

Keywords-preschool students; Jawi characters; self-access learning; learning strategy.

INTRODUCTION

Interactive courseware is one of electronic based learning materials, resulting from evolution of information and communication technology (ICT) in education. As Avril and Viv (2001) said, ICT in education is the electronic network that assists teaching and learning (T&L) process. David, Rob and Graham (2001) also stated the use of ICT in T&L process can support learning process in classroom, as well as self-learning. Meanwhile, ICT in children's world helps the way they think, change the way they learn and know how to interact better with other (Clements, 1999). The use of computer among children enable them to socially interact, work in group, increase self-confidence, appreciate their surroundings and enhance their language and interpersonal communication skill. Clements and Samara' study (2003) discovers that ICT learning material is crucial in supporting children learning through exploring and solving problem creatively. This study is supported by Noor Azli (2009) which affirmed that habitually children love fun games; hence the use of computer in *Jawi* learning can motivate preschoolers and cultivate good values among them.

PURPOSE OF STUDY

This paper aims to discuss whether the content of JQAP courseware can motivate the preschool's learning of *Jawi* script/letter and Quranic verse. *Jawi* is an adapted Arabic alphabet for writing the Malay language. It is one of the two official scripts in Brunei and Malaysia as an alternate script for the Malay language (Wikipedia, 2011). In depth, JQAP courseware focuses on learning and reading principle, as well as experiencing learning through identifying and combining the *jawi* script in a motivated learning environment. Jawi Script is derived from the Arabic Script, but then changed its name to *Jawi* because in Jawi Script there are six more new letters being added to it, in order to represent the six Malay phonemes

which are not found in the Arabic Language (Amat Juhari, 2008). This interactive multimedia courseware is purposely developed as an alternative teaching aid in learning Islamic Education for preschoolers. Based on the *Modul Panduan Guru Kurikulum Pendidikan Islam Pra Sekolah* (2009) published by Division of Publishing, Yayasan Dakwah Islamiah Malaysia (YADIM), transformation of Islamic and Moral Education for Preschool curriculum is lead to a better direction.

There are five (5) integrated contents in it, which are; belief (*akidah*), worship (*ibadah*), history (*sirah*), manner (*akhlak*) and basic of *Quran* and *Jawi*. Development of JQAP is also considered based on Curriculum Development Center (*Pusat Perkembangan Kurikulum*) (2001) which stated in Figure 1.

5.1.7 Identify the sound of *huruf* based on the mark (*tanda baca*):
- *Baris atas (fathah)*
- *Baris bawah (kasrah)*
- *Baris hadapan (dhommah)*

Figure 1 Excerpt of Preschool Islamic Education Curriculum (*Kurikulum Pendidikan Islam PraSekolah)* (Source*: National Preschool Curriculum(Kurikulum PraSekolah Kebangsaan),* 2001)

METHOLODOGY

In developing this courseware, ADDIE model is chosen as the methodology. ADDIE, stands for Analysis, Design, Develop, Implement and Evaluate, consists of five (5) phases in completing the task. Every phase executed will be observed and assessed. If the task is poorly done, the phase will be repeated until it is completely accomplished.

During analysis phase, analysis was done towards user needs, prior knowledge, awareness of using computer and openness to use courseware. Then, during design phase, interface, information flow and storyboard were designed to explain the framework of the courseware. Meanwhile, on development phase, the courseware interface is developed with interactivity taken into consideration. During implementation and evaluation phase, the courseware is nearly completed and is used to be tested by the user. Evaluation of the courseware consists of two (2) levels, which are alpha testing (internal) and beta testing (real user). Test upon the understanding of content and courseware usability, as well as market potential are conducted, in order to fulfill commercialization need.

INTERFACE DESIGN

The interface design of this courseware is being developed as simple as it can, so that the targeted users (preschool children) will encounter no error or only at minimal level. JQAP is organized to suit the method of reading *huruf* and Arabic phrase/sentences. At early stage, the structure of *huruf* and marker (*tanda baris*) is represented by using phrases. The structure of *huruf* is introduced, so that user will easily understand. Figure 2, 3 and 4 below are the examples of interface in JQAP courseware.

Figure 2 Main interface for JQAP Courseware

Figure 2 is the main interface for this product. Children have three (3) menus to be selected, which are;

i) Topic 1: learning Arabic language
ii) Topic 2: learning *Jawi* letters
iii) Topic 3: reciting short 'surahs' or verses.

Figure 3 Main interface for Topic 1

Figure 3 is the main interface for Topic 1, Learning Arabic Language. In this topic, children can either choose to learn or to play. In learning, they can manage to recognize each *Jawi* letter in the lesson. Meanwhile, in playing, they can play two (2) types of simple games, which are 'matching' and 'drag-and-drop'.

Figure 4 Main interface for Topic 2

Figure 4 is the main interface for Topic 2, Learning *Jawi* Letters. In this topic, children can also choose to learn or to play. In learning, they can learn to write the *Jawi* letter in the proper direction, or listen to the story inside it. While in playing, they can try to joint the letters in the correct way.

Figure 5 Main interface for Topic 3

Figure 5 is the main interface for Topic 3, Reciting Short 'Surahs' or Verses. There are also two (2) choices for children, either to learn or play. They can learn to recite the 'surah' or verse correctly; in this case, we start with 'Al-Fatihah' verse. In playing option, children can choose to play two (2) types of simple games, which are 'surah' arrangement and 'surah' quiz.

PRODUCT FUNCTIONALITY TESTING

In order to test and detect unexpected error (if any) during design and development phase, the prototype was then tested among a group of users with multimedia background. The test is all about the product usability during this alpha testing. Some of the withdrawals reported are such as below:

a) too much animation on the interface
b) display of duration is quite fast, this has caused difficulty for children to follow the reading
c) there was noise effect on the prayer recitation audition.
d) audio should be put on every instruction.

All the comments stated have been improved so that children will face minimal difficulties when using this product. Formative and summative evaluations have been done on the final prototype. Checklist form has been used for this purpose, meanwhile observation upon the users while using the courseware has been taken into consideration. Result shows that the respondents in this study have agreed with the presentation aspect and overall look of this product is able to attract children' attention to learn the *Jawi* script and Quranic verse using it.

CONCLUSION

As a conclusion, JQAP can be a self-assessment learning to train the children to learn by themselves. Teacher can guide and assist students where needed. This courseware also focuses on the effort to fulfill different individual requirement compare to the environment and conducive learning environment. This approach is based on the perception that only children can optimally accomplish it by themselves, as well as decide the best learning strategy that suits him/her. The development of JQAP is not only to establish the skill in understanding the Arabic language for Al-Quran, but also to promote the *Jawi* character heritance.

ACKNOWLEDGMENT

We would like to express our appreciation to Research Management Centre (RMC), Universiti Pendidikan Sultan Idris (UPSI) for the University Grant on this project.

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DEVELOPMENT OF TEACHER'S ETHICAL SIMULATOR SYSTEM (DTESS) FOR UNDERSTANDING SLOW LEARNER BEHAVIOUR IN THE CLASSROOM

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ABSTRACT

Teachers have a pivotal role to play in preparing a quality of young generation. They have to be effective, must draw upon a broad range of teaching skills, as well as to have empathy, patience and humility especially in dealing with slow learners' issues. In order to teach the slow learner students effectively, teachers have to learn and try to treat their problem individually. Motivated by this requirement, this research focuses on the development of Teachers' Ethical Simulator System (D'TESS); a Simulation System of Student Slow Learners within Classroom developed with Agent-based Model. The simulation can be a tool to assist trainee teachers understanding changes in social aspect of slow learner students, communication technique and thinking technique in dealing with this category of students. The developed system can provide simulation of cases related to slow learner students and the proper way of applying ethics as preparation and continue development of ethical values for professional teachers. The system will also covers problems related to slow learner cases for secondary school only. A central concern of this research is on the development of an interactive D'TESS that is usable in term of easy to learn, effective to use, and provide an enjoyable user experience. This paper reviews the development of D'TESS and how the simulation can be used in understanding slow learner behaviour in the classroom. Moreover, this paper will also cover emotional aspect of slow learner behaviour in order to provide understanding on how the simulation can be an effective tool for understanding the real behaviour of slow learner student in real classroom environment.

Keywords: simulation, slow learner

1.0 BACKGROUND OF THE STUDY

Vann (1989), Herman and Stephens (1987), Caliendo (1986), Cardozier (1985), and others have suggested that the quality of schools is primarily dependent upon the quality of teachers employed by the district. Teacher selection is one of the most important decisions that a school administrator can make (Vann, 1989; Wise, Darling-Hammond, & Berry, 1987; Moore, 1987; Smith, 1980). Current selection practices involved only examination and personal interviews. In general, not every individu is qualified to become a good teacher. According to Jensen (1986), characteristic of a good teacher are careful, considerate, ccoperative, dependable enthusiastic, forceful, healthy, honours, industrias, neat and open-mindedness, original and progresssive as well as informed.

This study is concern on the way that can assist trainee teachers on applying ethics as for preparation and continue development of ethical values of professional teachers. The existing practise of formal course as well as clinical experiences provide only limited opportunities for trainee teachers to reflect on the ethical questions they will soon face. The core of system is to provide simulated reaction based on realistics slow learner case study as preparation for them in facing the challenge on handling classroom scenarios. This research was therefore designed to improve the preparation of trainee teachers by studying ethical situations (case studies) and the actions trainee teacher can take to resolve them. The initial study

examined ethical decision making and the professional ethical philosophy of secondary teachers from urban, small town and rural areas of Malaysia in dealing with slow learner students. The identified slow learner case studies will be used as the main source in developing storyline in the simulation system. The real case study is adapted to the simulation in order to give the real situations or problems that the trainee teacher will dealing with in the classroom environment.
Case studies gathered from the experiences faced by real slow learner teachers were analyzed and were used to create the storyline. Then, each of the cases that concentrate on what the teachers action are analyzed and the resulting cases were used in the simulation in order to prepare future teacher for ethical decision making in relation to handle slow learner students. The usefulness and accuracy of the case studies used will evaluated on the first place by a group of researchers. In order to simplify the preparation of future teacher with good quality as well as ethic in dealing with slow learner student, then, the researcher have developed Teachers' Ethics Simulation System or also known as D'TES that can provide simulation of cases related to slow learner students. The simulation can be a tool to assist trainee teachers understanding changes in social aspect of slow learner students and communication technique and thinking technique in dealing with slow learner students.

2.0 CHARACTERISTICS OF SLOW LEARNERS

Slow learners are usually normal in appearance and are able to function satisfactorily in many situations, but people always face difficulty in identifying and understanding them. Balado (2003) has clearly justified the characteristics of slow learners comprises of:

- ability below grade level.
- is prone to immature interpersonal relationships.
- has difficulty in following multi-step directions.
- lives in the present and does not have long range goals.
- has few internal strategies (i.e. organizational skills, difficulty transferring, and generalizing information).
- scores consistently low on achievement tests.
- works well with "hands-on" material (i.e. labs, manipulative, activities).
- has a poor self-image.
- works on all tasks slowly.
- masters skills slowly; some skills may not be mastered at all.

It is not unusual to hear slow learners parents state that they are puzzled over their child's school difficulties since they seems to understand so well at home. This is supported by a study conducted by Kaznowski (2004) that aims to determine which group of slow learners was more successful in school in order to know if special education or regular education is the most beneficial educational "placement" for the slow learners. This study compared the school performance of a sample of slow learners who qualified for special education as learning disabled with a sample of slow learners who did not qualify for special education. Findings suggest that neither group of slow learners is successful in school; both are doing remarkably poorly. Given this outcome, it is very important that educators find the courage to acknowledge the difficulty of slow learners.

3.0 WHAT IS EMOTIONAL ASPECT OF SLOW LEARNERS THAT TEACHER ALWAYS DEALING WITH?

Emotion plays important role in influencing student intellectual developmental stage. Slow learner students or students with learning disabilities have similar characteristics and emotional ability to normal student but merely different in intellectual ability . They need secure environment, give and receiving love, acceptance and recognition from peer group, and also need of experiencing, be responsible and involving in new classroom activities (Reddy & Ramar, 1997). However, slow learner students need to be educated on how to control and use their emotional wisely in order to ensure learning process run smoothly. (Azizi, Yusof & Emir, 2005) also stated that because their emotion and their feeling

more dominating desire and their thinking, emotional change will be bringing large implication on their behaviour compared to other normal students.

Because of their normal physical appearance, there are always misperceptions of this category of students. They always expected to show similar performance as normal students. This higher expectation more that they are able to reach will create disappointment not only to parents or teachers, but also have the higher negative implication to slow learners' emotions themselves. When basic need which all human needs such as love , appreciation and acceptance from others could not be filled, emotional problem and behaviour will be developed and their self esteem and performance will be affected as well.

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Some emotional problems that apparently faced by most of slow learner students were low self concept, less self assured and always disappointed with something they performed. The negative emotions and the low self concept produced by limited experience in success and good achevement as well as by negative perception labeled by their parents, teacher and other communities (Sitagita, 2009). The negative perception that always comes into their mind is that they are group of students that will never be clever like any other people and unable to improve their level of intellectual no matter what they do. Abdullah & Ainon (2006) said that teacher is the main source of developing students' self concept and confidence. It is because the roles of teachers always overcome the role of parents and peer group. Due to this, teachers need to be more sensitive, tolerant and always show their love and attention in every of their action.

In order to ensure the effectiveness of development of slow learners' intellectual, confidence on themselves need to be builded parallel with their self concept because being positive is part of internal element for self concept. Unrealistic of hope and dream of parents that impossible to be achieved by this category of students can ruin their self confidence. Student will feel huge gap exist between their traits, qualities and value from others. Due to this, teacher should be extra careful in their action, expression and their words during teaching process so that the slow learner students never fee any gap exist with their other peer group. Hence, teacher should understand of slow learners' emotion and feeling and educate them to by encourage them by showing love and encouragement, not by force and negative physical enforcement. Teacher have rather important role in changing perception of parents on level of ability and capability of their children so that this students' emotional need can be filled and it can prevent emotional problems which can lead to the failure of teaching and learning in the classroom.

4.0 THE NEED OF SIMULATION FOR SPECIAL EDUCATION TRAINEE TEACHERS

Educational alternatives are required to prevent slow learners from continuing to fall through the cracks since student's inability to keep pace with the demands of the classroom can produce feelings of inadequacy, performance anxiety, depleted motivation, and even behavioral maladjustment (Levine and Barrienger, 2008). Generally, schools respond to such students with well-intentioned procedures or guidelines that fail to meet the needs of the thwarted learner. Thus, dealing with slow learners requires educators to be more proactive, creative and well-motivate especially in preparing the conducive environment and conducting the teaching and learning (T&L) activity. As the main target, the teaching and learning process should focuses on these three (3) major components consists of making the abstract concrete, not assuming generalization, and working towards automatization of basic concepts (Balado, 2003). In general, teaching these slow learners requires the information to be as explicit and concrete as possible just to ensure that they can see it, touch it, or do it, so the learning will be easier.

Education in Malaysia is on-going efforts towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonic, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving high level of personal well-being as well as being able to contribute to the harmony and betterment of the family, the society and the nation at large. The Ministry of Education Malaysia stated that the objectives of education are as below:

- To produce loyal and united Malaysian.

- To produce happy, well mannered individuals who have faith, knowledge and vision.
- To prepare the nation's human resource for development needs.
- To provide educational opportunities for all Malaysians.

Teacher is the one who's responsible to fulfill these objectives.

Ethics is a collection of moral standards by which each person should be guided in their private and professional life. It tells us right from wrong, and how to live moral lives. The teaching profession, as many others, has its own code of ethics, which describes the process of grading students and teacher's behavior in the classroom as well as outside the premises of the institution. It is one of few professions which evaluate the totality of behavior of an individual and its potential influence on others, in this case – students.

Despite the recent focus on teacher quality, the necessary step should be taken in order to provide guideline for trainee teachers to face the real world of education. Nowadays, teachers not only focus on delivery of knowledge but also need to cater every aspects of problems relate to students. Teacher must achieve the standards of professionalism and ethics of a teacher as highlighted by the Ministry of Education (MOE), Malaysia. The guidelines for teacher prepared by MOE are deceivingly simple. Most teachers who read the guidelines believe that they would never employ in an unethical behavior. Nevertheless, every year a few will find themselves caught in bad situations which begin with a seemingly inoffensive conversation except the experienced teacher who can avoid mistakes that cause the bad situation. These experienced teachers learn best from their mistakes all the years. Excluding inexperienced teachers will burden with wrong decisions. If the mistake done by the new teachers could ruin a reputation or career as a teacher, it would be best to make it in a simulation Therefore a new method in learning the professionalism and ethics of a teacher should be done in order to enhance the professionalism and ethics of teachers. In university for example, trainee teachers not exposed to a real situation in classroom. They only learn about theoritical aspects to deliver knowledge in classroom. The trainee teachers seem to be lack of knowledge on how to decide or reflect on situation related to students' problems. This situation may lead to unethical decision making because they do not have any practical guidance to handle this situation. There are many cases related to students' problems such as slow learner, misunderstanding, lack of attention, demotivation, individu differences and behavioral problems.

The most common ethical problem that any teacher will face at some point in time is the bias-free assessment of students. Teachers are supposed to create a learning environment that fosters autonomy and guides students in their learning experience. An important part of their work is evaluation of students' knowledge and progress. Without such an assessment, one cannot determine if the learning is taking place. And this is one of the most problematic areas of the job. But what does a "to assess a student" mean? Teachers will apply a set of rules and predefined formulas to measure the amount of knowledge that has been successfully retained by students or perhaps they will check the understanding of a problem being considered. This research will focus on slow learner cases that will provides simulation on how trainee teachers should solving student slow learners cases within classroom. With the purpose of providing trainee teachers the best practise of applying the teachers' ethics and to understanding the slow learner behaviour, a selected case study which represent the real scenario of this category of students is used in the DTESS' development phase.The heart of this research is divided into two scopes which are to develop the Teachers' Ethical Simulator System (D'TESS) and to provide analysis on teachers' actions in dealing with the student slow learners situation.

5.0 HOW COMPUTER SIMULATION (DTESS) CAN FACILITATE LEARNING AND UNDERSTANDING BETTER?

The world of education is changing. Teachers nowadays have to deal with the delivery of knowledge as well as to take care on issues related to students. They not only have to teach but their role changing from the teacher that have to teach to the educator that not only have to teach, but also have to educate student to differentiate what is bad and what is wrong as well as to show students the right path to choose to be a better mankind. In the previous era, when we are still young, teachers' job seem to be so easy, they work

half time in a day and only focus on how to deliver knowledge in a proper way to make their students' understand better without have to concern about students' problems. Nowadays, with the growing of technology where information and knowledge can be learned anywhere, the world of education also have to cope with that.

Computer simulation is the discipline of designing a model of an actual or theoretical physical system, executing the model on a digital computer, and analyzing the execution output. Simulation embodies the principle of ``learning by doing'' to learn about the system we must first build a model of some sort and then operate the model. The use of simulation is an activity that is as natural as a child who *role plays*. Children understand the world around them by simulating (with toys and figurines) most of their interactions with other people, animals and objects. As adults, we lose some of this childlike behavior but recapture it later on through computer simulation. Simulation is the imitation of the operation of a real-world process or system over time.
Simulation involves the generation of an artificial history of the system and the observation of that artificial history to draw inferences concerning the operating characteristics of the real system that is represented. Simulation is an indispensable problem-solving methodology for the solution of many real-world problems. Simulation is used to describe and analyze the behavior of a system, ask – what if questions about the real system and aid in the design of real systems. Both existing and conceptual systems can be modeled with simulation. A simulation is designed to provide users with possibilities to intentionally interact with the program, making various decisions and inputs, and to observe the consequences of their actions. Simulations can be divided into two broad categories: operational (learning to act on a specific evolving situation) and conceptual (learning the content by inferring and making experiments), and the learning can take place either by using or building simulations. Generally simulation-based learning has been argued to be highly motivating and engaging, and leading to deeper understanding of content and development of higher order thinking skills.

This research will concentrate on the case study related to slow learner students in school. The slow learner is a common problem in any school in Malaysia. The slow learner is usually normal in appearance and is able to function satisfactorily in many situations. But the slow learners have some difficulty in understanding and have a low performance in ability to complete for schoolwork exercises. This group of student will contribute to poor academic results which can give bad impacts to the schools. The schools are no longer can maintain its mission to produce excellent students. But this group of student is not to be blame 100%. The administrators and also the teachers should help the students to overcome their problems using psychologist method. The proper way to handle the problematic students needs to be identified in order to prepare trainee teachers to deal with students with this specialty. In order to face the challenging world of education, the trainee teachers have to prepare themselves and learn various psychology techniques in order to understand students' with slow learner characteristics and create teachers' own personality to promote respects and proper way in handling with students' problems. Slow learners students come from different age, personality, background and ability to learn. Teachers have to learn to deal with the variety in slow learner students' background because their problems have to be treated individually.

Initial or pilot study has been conducted by a group of researchers in order to gather information on what the actual cases faced by real teachers in the real school environment in dealing with this category of students. 10 schools in various states in Malaysia have been chosen as the sample of the study. Then, the finding of all the cases gathered from each sample of study population have be analyzed to be used as the based in developing the simulation. The study was conducted by using the interview and observation session in the selected classroom. Findings showed that students with low self confident and low self esteem not active in class and also not interested to join any activities in the classroom. The observation also shows that teachers always use various approaches in order to get all students attention and give more attention to slow learner students in order to develop their self confident. The literature review and the action taken by experience teachers are used as the source in determining the content of the ethical value used in the simulation system developed.

Features of Simulation System (DTESS):

1. Attractive and interactive interface.

2. 3D simulation in classroom setting.
3. Storyline for simulation was developed based on the real problem faced in the classroom environment.
4. Pedagogical agent in simulation acts, guides, reflects and assist trainee teacher while using the simulation.
5. Result and analysis in respond of the use of simulation will determine the readiness and ethical value that the user has applied in dealing with the slow learners' problems.

The Teachers' Ethical Simulator System (D'TESS) can be a tool as pre-exposure for trainee teacher in dealing with student slow learner cases within classroom. The importancy lies on the pre-exposure of trainee teachers to theoritical aspects and a teaching training only whilst the real exposure of handling students' problems within classroom is no highlighted during their studies. Therefore the development of the system focuses on trainee teachers to gain real experience through simulations on solving student slow learners cases. The system creates an interactive scenario in which the trainee teachers had to go through in the life of a teacher. The system will provides a case study of student slow learners cases these trainee teachers must communicate with the three main elements comprises of principal/assistant principal/coordinator, parents and students themselves. An analysis on response given by trainee teachers during interaction with D'TESS will be generated at the end of its usage. The trainee teachers also will be given appropriate response to deal with the situation. The trainee teachers who played the simulation would find themselves in an unethical situation in solving student slow learners cases from which they could not escape. They would learn from that failure and not fall into the same mistakes on the subsequent attempt. The trainee teachers gain the knowledge to identify the mistakes and make more effective choices of actions. Therefore the benefit of simulated experiences in the D'TESS is that failure does not mean the end of the life of a teacher.

6.0 CONCLUSION

Good simulations are *like* reality, but not perfect replications of it. Instead, a *good* simulation replicates the job environment in most of its important details — enough to create a situation in which the participant can "live" the situation without undue harm. Ideally, responses become affective or intuitive, but this varies by simulation type, since not all work situations require affective or intuitive responses. DTESS is a recipe that identifies the case studies of slow learner and make possible interaction between teacher and slow learners student in the simulation which can be monitored and tested regularly in order to make trainee teachers understanding on the implication of applying an ethical solution in classroom environment. Apart from that, simulations compress real experiences into a situation that can be manipulated to produce maximum learning impact, without having to wade through many random events looking for one nugget of truth. The development of DTESS can be a better tool to assist trainee teacher understanding the world of slow learner perspective and how to handle them in the real classroom better.

Acknowlegement

The authors wish to acknowledge the support of the Research and Management Centra, Universiti Pendidikan Sultan Idris, who awarded a research grant for this study.

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DEVELOPMENT PROCESS OF A WEBQUEST FOR FRICTION

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ABSTRACT

WebQuests become a widely used tool in order to integrate technology in teaching and learning process since 1995. They help to enhance students' information technology and literacy skills. Moreover, WebQuests allow students to analyze and synthesize information, not just summarize it. They give opportunities to enhance and use higher level thinking skills.

In Turkey, a new physics curriculum for high school students was developed. This curriculum supports the use of technology in the classes for the better understanding of concepts. Moreover, it requires the use of several technologies to design and plan effective learning environments and experiences for students. It also suggests student-centered learning activities.

In this study the researchers developed a WebQuest for the topic of "friction". In this paper, details of the development process and the developed WebQuest will be presented. This WebQuest can be used as in-class activities compatible with the new physics curriculum. This paper was derived from the PhD thesis of the first author.

INTRODUCTION

Over the time, educational technologists have developed several web based activities in order to have effective use of the web in teaching and learning process. As one of these activities, WebQuest model was developed by Bernie Dodge and Tom March in 1995 (Dodge, 2001a). Dodge (1995) defines WebQuest as "an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on Internet, optionally supplemented with videoconferencing" (para. 2).

There are two types of WebQuest with respect to duration and learning outcomes (Dodge, 1995). Dodge identified these two types as short-term and longer term. Short-term WebQuests are designed to be completed in one or two class sessions with the aim of knowledge acquisition and integration. On the other hand, longer term WebQuests are took up to a month to be completed. These WebQuests aim to extend and refine knowledge.

Thousands of WebQuests can be found over the web with a simple search. Most of these WebQuests are just simple worksheets containing several web addresses and are far away from real WebQuest model (Dodge, 2001a). According to March (2003), if one just goes and collects information from web pages and prepare a product by using them directly, this activity become something else but not a WebQuest. He further explains that newly acquired information should be transformed into something new by the learners. In the current study, the friction WebQuest was developed to ensure students to use higher order thinking skills to design an experiment and present it with a poster. In the development process, criticisms to WebQuest model and advices of the founders of WebQuest model were taken into account.

CRITICAL ELEMENTS OF WEBQUESTS

WebQuests are usually designed for group works. In a typical WebQuest, there is a scenario to be followed by the learners. At the end of WebQuest activity, learners are required to prepare a product either online or offline. A WebQuest consists of six essential sections:

- Introduction: This is the first section of WebQuests. In this section, it is aimed to get students attention. Moreover, background information about the current topic can be presented in the introduction section (Brooks & Byles, 2000). It is basically a short paragraph explaining why students will complete the WebQuest (Chatel & Nodell, 2002).
- Task: This section is where the students' task is presented. Details of the expected product are given in this section (Brooks & Byles, 2000). If relevant, roles of the members are described.

- Process: In the process section, detailed information about how students complete their task is given. Aim of this section is to provide a guideline to the students. The author of the WebQuest can give tips on managing times and collecting data at this section (Yoder, 1999). Explicit directions should be listed too (Chatel & Nodell, 2002).
- Resources: It is where the chosen web resources are presented. This section allows students to use their class hours effectively without wasting time on searching inappropriate websites (Chatel & Nodell, 2002). Vidoni and Maddux (2002) state that the resources section does not have to contain merely online resources.
- Evaluation: An evaluation rubric is presented in this section. In this rubric, students should see how their work would be evaluated. Evaluation part should be connected with the information given in task section (Chatel & Nodell, 2002).
- Conclusion: A brief one-paragraph conclusion statement is given in this section. One can add higher level questions to be researched in this section (Brooks & Byles, 2000). There should be few sentences about what students learned through WebQuest (Chatel & Nodell, 2002). It is aimed to extend students' knowledge in the conclusion section.

CREATING WEBQUESTS

Dodge (2001b) classified the design patterns by examining existing WebQuests. He stated that if a WebQuest task contains "design, decide, create, analyze and predict" verbs, they usually require higher level thinking skills. According to Dodge, these types of the designs can be categorized as follows: design, decision, analysis, prediction, and creative tasks. Dodge (2002) proposed taxonomy for WebQuest tasks. He stated that a WebQuest could include more than one of them; and, expressed following tasks: compilation, journalistic, retelling, consensus building, mystery, design, judgment, creative product, persuasion, analytical, self-knowledge, and scientific.

Dodge gives five guiding principles to create good WebQuests. He identifies these principles as FOCUS:

- Find great websites: The websites should be suitable to the target group in terms of readability and cognitive level. They should be interesting and contain up-to-date accurate information.
- Orchestrate your learners and resources: One should create WebQuests by considering resources. A WebQuest should be designed to use every available computer. Moreover, every student should be part of the process by using a group work strategy.
- Challenge your learners to think: A good WebQuest should ask something more than memorizing or paraphrasing. At this aspect task of the WebQuest play an important role. It should give opportunity to engage students in problem solving, creativity, and judgment process.
- Use the medium: In a WebQuest it is possible to use different source of the information. One can design a WebQuest that includes peer discussions or "ask to expert" type of activities over the web.
- Scaffold high expectations: Scaffolding should be used in a WebQuest to help students perform high tasks. Scaffolding takes place in the process part of WebQuest. Dodge (2000b) states three types of scaffolding that can be used in a WebQuest: reception, production, transformation. Reception scaffolding occurs when helping learners to see what is important from the given resources and how to organize findings. Production scaffolding is giving guidance to help learners to create their product. That can be with supplying a template or giving structure of what is expected. Transformation scaffolding is to help learners to transform the information to some other form like diagram and chart (Dodge, 2000a).

CRITICS TO WEBQUEST MODEL

Vidoni and Maddux (2002) state that the popularity of WebQuest may due to its name. They express that it sounds like "high tech" concepts and applications, therefore teachers tend to use it. Moreover, they state that although WebQuest has ability to improve critical thinking skills, WebQuest model is not perfect. Vidoni and Maddux explain their claims by referring developmental nature of cognition. They say that WebQuest model does not offer any difference for different graders. A WebQuest for first graders is developed with the same way for graduate students. Furthermore, they expand their claim by saying that existing WebQuests do not seem to be related to the curricular content of the target level.

Maddux and Cummings (2007) extend criticism to the definition of WebQuest. They claimed that short-term WebQuests do not seem to be consistent with Dodge's definition that is based on looking for information and summarizing. Short-term WebQuests do not to require the use of high order thinking skills; therefore, they are not true WebQuests at all. Maddux and Cummings expressed that longer-term WebQuest is true WebQuest. They also repeated claims of Vidoni and Maddux (2002) about cognitive development. They stated that Dodge and March did not care about learners' cognitive development level and use of WebQuests was not appropriate for lower graders.

HIGH SCHOOL PHYSICS CURRICULUM AND WEBQUESTS

A new national physics curriculum for high school students was published in Turkey in 2007. This curriculum supports the use of technology in the classes for the better understanding of concepts (TTKB, 2007). Moreover, the new physics curriculum is based on real life context-based approach in which the connection between abstract physics concepts and real life is emphasized. At a typical WebQuest, the task can be structured to allow students to investigate real life based events.

The new physics curriculum also comes with new highlighting that imply skills gaining and improving processes. One of these skill categories is "information and communication technology skills" (ICTS). The ICTS deal with the information technologies and basic computer skills. The ICTS aim students to "search, find, and select appropriate information", "develop information that suits their purpose", "present information in the most efficient way", "develop communication skill", and "develop basic computer skills" (TTKB, 2007). Each of these categories has associated actions detailed in the curriculum. Table 1 compares these actions with WebQuest components.

Table 1 Comparison of the ICTS with WebQuests

Actions	WebQuest Component
Search, find, and select appropriate information	
Use different resources of information	Resources
Check the reliability and validity of the information sources	Resources, group work, teacher guidance
Use multiple search criteria	Task, process
Search, find, and select information appropriate to the purpose	Task, process
Develop a strategy to use information technology skills	Creating/designing a product
Present the information in the most effective way	
Prepare appropriate presentations that have correct outcomes	Creating/designing a product
Use different formats such as text, numbers, pictures, graphics, or tables at the presentations	Creating/designing a product, Presentation of the product
Use technologic environments (Internet, computer, projection, video, etc.) to perform effective presentations	Presentation of the product
Develop communication skills	
At the physics related communications (verbal, written, visual, etc.) use appropriate terminologies	Creating/designing a product, Presentation of the product
Express complex information clearly and briefly	Analyzing resources, Presentation of the product

THE FRICTION WEBQUEST

In the current study, a short-term WebQuest for the topic of "friction" was developed. This WebQuest was for ninth grade physics students. There are two content related objectives for friction in the physics curriculum. These are "explore the factors that friction depends on experimentally" and "explore the differences between static and kinetic friction experimentally". In this WebQuest, the students are required to design an experiment with respect to these objectives and create a poster to present their experiments.

The first stage in the development process was to decide on a scenario for the WebQuest. Basic factor to decide on the scenario was skill objectives, especially problem solving skills to have students to use each skill through the WebQuest activity. To allow students to think about factors affecting friction and differences between static and kinetic friction, the scenario was written with the idea of having someone working at a shipping company and drifting different sized packages. After having scenario for the WebQuest, the introduction, task, process, resources, evaluation, and conclusion parts of the WebQuest were written. With respect to Dodge's (2002) taxonomy of tasks, the friction WebQuest included design, creative, and product tasks.

The next stage was to develop web pages for the WebQuest. The WebQuest were developed with PHP web programming language and MySQL database to allow dynamic template layout that can easily be changed from the database. Visual design principles for instructional content were taken into account at this stage. The design was completed and the WebQuest was published. Each of the WebQuest page has link to the printable version of the WebQuest.

The expert evaluation form was prepared to evaluate the WebQuest. The rubric for evaluating WebQuests by Bellofatto, Bohl, Casey, Krill, and Dodge (2001) was used to prepare this evaluation form. Finally, the WebQuest outline, which contains the distribution of the objectives and brief information about procedure, was prepared. The expert evaluation form, WebQuest outline, and WebQuest printable version were used to get the experts' opinions. The WebQuest was reviewed by four physics education experts. However, the researcher gave the WebQuest to one of the experts at first. After getting feedbacks for the WebQuests, it was modified and the modified version was given to three other physics education experts to review. Through this process, the WebQuest was revised and the WebQuest website was updated.

The feedbacks and the actions taken against them can be summarized as follows:

- Overall relevance with objectives: It was seen that the friction WebQuest was compatible with course objectives.
- Grammar: There were several grammatical errors pointed by the experts. These errors were fixed and double-checked before updating the WebQuest.
- Layout/Design: Layout of the WebQuest was slightly modified to increase visual attractiveness. The navigation graphics were modified with respect to color scheme. Moreover, name of the next or previous sections were added to each graphics to enhance navigation.
- Task relevance with objectives: When the feedbacks from the first expert were taken, it was decided to give the instructional objectives directly in the task section. Therefore, the task of the WebQuest was modified to include the objectives directly in it. The other experts' feedbacks showed that the task section was relevant with the objectives.
- Task clarity: The task of the WebQuest was slightly modified to make it clearer. These changes were just based on enhancing flow.
- Process clarity: Each step at the process section was detailed to make sure that the students could follow the steps easily.
- Resources: Some of the resources that contain duplicate content or that do not contain valuable information were removed while some others were added. It was pointed out that some of the objectives were not represented with appropriate number of resources. This issue was fixed by adding more resources for respective objectives.

In the current study, the introduction section supported with a video to enhance the effect of the introduction on students. Moreover, in resources section, several websites that does not include accurate information were also listed. The reason of this was to comply with the course objectives that require students to choose correct information and differentiate necessary and unnecessary information. Moreover, the book of the course was also listed as an offline source to provide different type of the information sources to the students. The introduction section and general layout of the friction WebQuest can be seen in Figure 1. The navigation and color theme are the same at the other sections. It is not possible to include other sections of the

friction WebQuest in this paper due to page limit. However, this WebQuest can be seen at http://www.webquestdatabase.com/webquest.php?webquestid=6.

Figure 1. Screenshot of the introduction section of the friction WebQuest

CONCLUSION

In this paper, WebQuests and their development process were discussed. Moreover, their critical elements and compatibility of them with the new physics curriculum were discussed. WebQuests can be used as powerful tools in in physics classes. The friction WebQuest that developed in this study can easily be integrated with the curriculum and teachers can use them in their classes. It should be noted that development process of the WebQuests can take much time and become overwhelming. However, once it is developed, it can be used and accessed at anytime from anywhere. Deciding on a task was one of the most challenging parts of the WebQuest development in the current study. Teachers or researchers should critically examine course objectives and think about corresponding daily life events to decide on a task. Moreover, it can be good to examine pre-developed WebQuests to have an idea about the tasks.

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DEVELOPMENT OF ONLINE READING TEST

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Abstract

This research aims to (1) develop and (2) validate an online English reading test; (3) study the reading performance-level; (4) analyse common weaknesses; and (5) propose the reading guidelines. 31 informants. Instruments included (1) 3 sets of English reading tests; (2) test evaluation forms, and (3) a test-specifications crosscheck form.

Results revealed (1) 3 sets of tests. (2) The tests are qualified as specified; the tests were modified according to the IOC scores of lower than .50; the reliability of the 3 sets was analysed by *Kuder Richardson* 20 formula, which yielded .86, .88, and .61 respectively; the difficulty and discrimination was accepted at .20 < = p <= .80; (3) the reading performance level of the 3 versions 1 , 2, 3 yielded 16, 14, 18 B1 level test-takers, 12, 14, 11 B2 level and 3, 3, 2 C1 level respectively; (4) insufficient understanding of complex structure and vocabulary were found; (5) reading strategies practice was proposed.

Keywords: reading tests, reading test specifications, reading performance level, online reading test

Introduction

Today's advance in social and economic development leads to the need for proficient English personnel in all areas, especially in international business. Moreover, the ASEAN agreement on the cooperation among the regions (http://www.mfa.go.th/web/200.php?id=21888) emphasizes the needs for the language of ASEAN countries—English. Sukhothai Thammathirat Open University (STOU) has been a leading open and distance-learning university offering English language courses since 1980 to a large number of students, adopting various technologies. A research and development on Development of English Test Via Electronic Media in a Distance Learning System, online testing for English for Computer Users, English for Office Staff, and English for Communication have been offered. (http://www.stou.ac.th).

This research aims to (1) develop an online English reading test; (2) validate the quality of the test; (3) study the reading performance-level of the test-takers; (4) analyse common weaknesses found in the test results, and (5) propose guidelines to improve the reading performance of test-takers. Informants were 31 academics and graduate students.

Literature review

(1) The general characteristics of online reading tests at the time of research

From the search engine using English test, there are 7,540,000 websites, offering the test—both free and with payment. Some offer samples of the test to lead to tutorials or book selling. The target groups are students who wish to learn English and to evaluate their proficiency. The activities come in various formats such as part of the standardized tests such as TOEFL, GRE, and IELTS, which offer reading tests. Many educational institutions offer online proficiency tests for their own students.

The online reading tests offer either separate reading passages or paragraphs with multiple choice questions. The language points are tested at the level of word, sentence, paragraph and discourse. Main idea and supporting details, and pronoun references are measured at the paragraph and discourse level. The answer keys, overall marks, explanation for each item and recommendation were provided. Another parallel set of tests for the same language point is also offered for second trial. In Thailand, a few online reading comprehension tests are offered by the Centre for English language development, High Education Commission. Some common technology such as multiple choice and drag and drop at various levels have been adopted (http://www.eldc.go.th/eldc3/page/e_exam/index.jsp Retrieved August 31, 2010). Moreover, from the survey on Thai universities, online courses on content subjects exist but no English tests.

(2) Online English tests offered at STOU

At the time of research, STOU has offered an online English test developed by Vanijdee et al. to the public (http://stou.ac.th). The test takers can test their listening and speaking skills in a form of multiple choices and subjective tests. Test takers are able to speak and record their own answers on the computer. The files are down loaded for teachers to mark. The results are presented for each item, not the overall results. In addition, English for Communication, English for Office Staff, and English for Computer Users courses offer online tests in multiple choice form and evaluation of the language content in each subject.

(3) The significance of reading skills

Reading is the skill that enables students to access overwhelming academic content online, mostly in English. The reading ability for graduate level includes reading research, articles, and textbooks; they must be able to deduce the concepts and issues to apply in their own research; they have to be good at grammar, register and critical reading. The preparation for reading performance is thus very important—like tools to access knowledge.

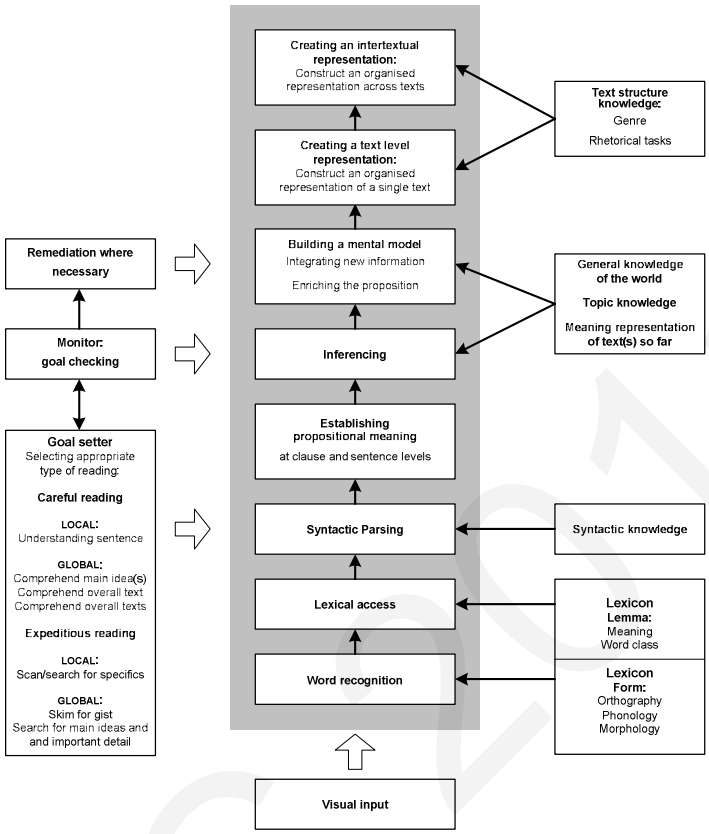
Munby (1978, in Alderson, 2000: 10) distinguishes the microskills which have been adopted by later researchers and cover a wide range of reading skills. These comprehensive lists are worth full quote here: (1) recognizing the script of a language, (2) deducing the meaning and use of unfamiliar lexical terms, (3) understanding explicated stated information, (4) understanding information when not explicitly stated, (5) understanding conceptual meaning, (6) understanding the communicative value of sentences, (7) understanding relation between parts of text through lexical cohesion devices and through, (8)grammatical cohesion devices, (9) interpreting by going outside it, (10) recognizing indicators in discourse, (11) identifying the main point or important information in discourse, (12) extracting salient details to summarise (the text an idea), (13)extracting relevant points from a text selectively, (13) using basic reference skills, (14) skimming, (15) scanning to locate specifically required information, and (16) transcoding information to diagrammatic display.

Reading skills not only involve the ability in language but also the ability in thinking, analyzing, summarizing, and interpreting. Davis (1968, in Alderson, 2000: 9) identified 8 skills: (1) recalling word meanings (2) drawing inferences about the meaning of a word in context, (3) finding answers to questions answered explicitly or in paraphrase, (4) weaving together ideas in the content, (5) drawing inferences from the content (6) recognizing a writer's purpose, attitude, tone and mood, (7) identifying a writer's technique (8) following the structure of a passage.

(4) Framework for reading process

Khalifa & Weir (2009: 62) present a comprehensive reading model, which covers thorough reading process. In designing a reading test, every factor in the reading process must be taken into consideration to maximize the evaluation efficiency. In the model, if considering cognitive validity in the middle column and the right column simultaneously, the core of comprehension starts from visual input up to word recognition whose lexical includes form and meaning; lexical access; syntactic parsing; establishing propositional meaning; inferencing; building a mental model which the readers have to apply general world knowledge, topic knowledge and meaning representation of texts; creating a text level representation; and creating an inter-textual representation which concern text structure knowledge, genre and rhetorical task.

The left column represents reading process from goal setter, which is divided into careful reading and expeditious reading at local and global levels. The local level involves understanding sentence in careful reading and scan/search for specifics in expeditious reading. The global level covers main idea(s), overall text(s) in careful reading and skim for gist, main idea and important detail in expeditious reading. Then the process moves to monitoring and remediation where necessary (Khalifa & Weir, 2009: 62).



(Khalifa & Weir, 2009: 62)

The reading evaluation process thus is based on the reading principles and processes; however, other crucial elements such as test taker characteristics and administration are also involved (Shaw & Weir 2007) but is not the focus of this online reading test. This online reading test is for the general public and not a compulsory test focussing on the level of performance of the test-takers, so it does not cover the administration.

(5) The online reading test design and construction

This online reading test was based on the reading process (Khalifa & Weir, 2009: 62) and the framework of references for languages CEFR (Common European Framework of References — Council of Europe) (www.uk.cambridge.org/elt) and the detail specification of each level by Unaldi (2009).

This online reading test was designed to evaluate and analyse the test takers' performance as presented in the test specifications, focusing on the strong and weak points of the test-takers at the global and local level. Test specifications were designed to help discriminate the different reading comprehension levels. The tests were divided into three sections: grammar, vocabulary and reading passages with contents based on academic domain. In addition, the reading performance was measured at the level of word, sentence, and discourse. Content validity and reliability were at the basis of the design (Weir, 1990: 22; Hughes, 1996: 22).Also, the contents of the test are authentic or "real life language use" as Bachman puts it (Bachman, 1995: 41).

Test specifications were designed based on the mikroskills from Alderson (2000) and test usefulness by Bachman & Palmer (1996). Alderson (2000: 169) covers comprehensive details of test specification that may be grouped into (1) the test itself – objectives, structure, skills, level of difficulty, task types, quantity of passages and items, etc (2) the test takers and (3) the administration. Bachman &Palmer (1996: 133-156) proposes that test usefulness can summarise and predict the test taker's performance and since the results of the performance can be used to judge people in work or academic,

cautious and thorough design must be adopted. These issues are (1) reliability (2) construct validity 3) authenticity (4) interactiveness (5) impact (washback effect), and (6) practicality.

(6) Relevant research

At the time of research, no direct relevant research in Thailand is available. Since tests are either public or business where confidentiality is taken into account, no result analysis is advertised.. However, some research in reading can be useful such as the topic and the reading ability (Vongpadungkiat, 2006); the relationship between test takers and reading texts (Vongpumivitch, 2004); the relationship among attitudes toward computer, stress and familiarity with computers and the reading comprehension ability test on computers (Kiratibodee, 2005); and strategies and test taking (Phakiti, 2008).

Methodology

1. Informants are 31 graduate students and academics.
2. Research instruments cover

(1) **The qualification test evaluation form**. The form was used by three English professors and two evaluation professors to evaluate the overall picture of the test adopting the checklist of Bachman and Palmer (1996).

(2) **Test specifications crosscheck form**. This was used to cross-check actual items in grammar, reading and reading text against the test specifications.

(3) **The online reading test.** The process of development of the online reading test was as follows.

3.1 Study the electronic tests online and offline both offered in Thailand and international, especially reading tests.

3.2 Study computer use in electronic test design and the evaluation of the computer based tests.

3.3 Develop three sets of online reading test with the following details.

Each test consisted of three sections: grammar, vocabulary and reading passages, covering 100 marks. Task types cover discrete items and discourse level questions items. Discrete items were used for grammar that concerned reading ability such as applying knowledge of structure to interpret meaning at word level and sentence level. Discourse level was represented in reading passages measuring the comprehension, main idea, and relevant details. Response methods covered multiple choice questions, matching, and gap filling.

(1) The test specifications for reading were based on CEFR (Common European Framework of References). Unaldi's (2009) comprehensive framework was adopted for outlining detailed test specifications for B1 B2 and C1 level.

Reading texts were processed through vocabulary profile of 'lexitutor' for their detail analysis of vocabulary (http://www.lextutor.ca/vp/). Flesch-Kincaid Grade Level was also employed for reading level. The processed texts were then modified to fit the test specifications in all details. After the reading passages were processed, the questions and question formats were designed.

(2) The grammar items were selected from Grammar City & Guilds ESOL for all three levels: B1 (Achiever) B2 (Communicator) C1 (Expert). Multiple Choice Questions with four alternatives.

(3) Vocabulary was selected from AWL (Academic Word List) at the individual word level, sentence level, and paragraph level (http://www.academicvocabularyexercises.com/#what). The response format covered the identification of the word (this was cancelled because of the software limited ability); multiple matching of the words and meaning; gap filling; replacing the word in sentences; the use of parts of speech; the use of vocabulary in context; identifying the details of reading ability based on CEFR.

(4) Explanation was prepared in the three sections: (1) for each individual item in the grammar section (2) meaning, how to study vocabulary, and useful websites in the vocabulary section (3) how to apply grammar knowledge to interpret meaning from the text, and useful websites for practicing in the reading section.

(5) Three English experts and two evaluation experts evaluated the online reading test for content validity, utilizing IOC (Item Objective Congruence Index) values. Items with IOC value lower than 0.50 were modified. Using test specification crosscheck form, the experts cross checked the items contents against the objectives and the detail of the test. Moreover, the contents that reflect reliability, construct validity, authenticity, interactiveness, impact, and practicality were also evaluated in qualitative form.

(6) The online reading test was first piloted with five interested bachelor degree persons. The language and items were then modified according to Bachman's list (Bachman & Palmer (1996) and by the scores and test-takers' comments.

(7) The online reading test was trialed at the second time with 31 test takers online (LAN) to yield the difficulty level and discrimination quality. Both content and explanation were then modified again. This step included the technique in doing the test online. The reliability was calculated using KR 20 formula.

(8) The final modified online reading test was offered through STOU websites (http://www.stou.ac.th).

Data analysis

(1) The content analysis of the content validity of online reading test was done through the test evaluation form.
(2) The tests were modified according to the IOC scores of lower than .50 and the experts and pilot-test takers' suggestions together with the trial test scores of the pilot-test takers.
(3) The difficulty and discrimination of each item at .20 < = p <= .80 was accepted; the rest were modified.
(4) The reliability of the 3 sets was analysed by *Kuder Richardson* 20 formula.
(5) The test scores and the level of reading ability from informants were analysed by percentage, average, and standard deviations.

Results and discussions

The results of the research are explained in the following order:

1. **Three sets of online reading test**

The design of the online reading test

The objectives of the test were to measure reading comprehension ability at the word level, sentence level, paragraph level and discourse level. Three sets of test with 100 marks each, divided into grammar (30), vocabulary (30) and reading (40). Task types included (1) discrete items on grammar involved in reading such as applying the knowledge of structure to interpret the meaning in the text. (2) at the discourse level; measure reading comprehension, main idea, and detail. Inferences and analysis were also included. Response methods covered multiple choice, multiple matching, and gap filling.

The levels of reading ability were based on the overall reading comprehension details from CEFR at 3 levels B1 (Threshold) B2 (Vantage) C1(Effective operational proficiency). The target group covered graduate students and academics. (CEFR (Common European Framework of References) for languages Retrieved from www.uk.cambridge.org/elt on April, 19, 2010, p. 69)

The level difficulty the reading passages adopted Unaldi (2009)'s details. She focused her study on the difficulty level of the text and has proposed a comprehensive framework when designing tests:

- Contextual covers response method and text length
- Discourse mode covers genre, pattern of exposition, and explicitness of text structure.
- Structural resources covers words per sentence, Flesch-Kincaid Grade Level, the complexity of sentence structure, and cohesion
- Lexical resources covers K1 K2 K3 words; AWL words
- Nature of information in terms of abstract/concrete
- Content knowledge in terms of required/not required
- COGNITIVE: Type of reading main idea; detail, implication
- Text level covers word, sentence and across sentences

The level of difficulty of the vocabulary was processed through lexitutor software (http://www.lextutor.ca/vp/). The analysis revealed frequencies of vocabulary, types and levels (K1, K2, K3, AWL); types, tokens, families, tokens per family, types per family). Flesch-Kincaid Grade Level was also taken into consideration when adapting reading texts to correspond the specifications in B1 B2 C1.

Details of the grammar items were based on Grammar City & Guilds ESOL which are comparable to CEFR at three levels: B1 (Achiever) B2 (Communicator) C1 (Expert). The response method was multiple choice. The academic words in the test were selected from AWL (Academic Word List).

The response methods for vocabulary were mostly multiple choice questions at the word level, multiple matching, gap filling for synonyms or for the use of parts of speech and (6) vocabulary in context.

This online reading test adopted the multiple choice questions where test takers can scroll the screen to check their reading passages; no time limit, answer keys and explanation were provided. However, the best format would be the reading text on the left and the questions on the right where test takers can scroll the text.

With the use of software from STOU (*A*Tutor), the following elements in designing computer tests are considered: navigation, terminology, page layout, text, text color, tool bars and control, icons and graphics, help facilities, item types, forms for writing and short answer tasks, and feedback. (Chapelle C.A. & Douglas, D. (2006) from Fulcher (2003: 384-408).

Explanation for improving reading ability

The recommendation focuses on 3 strategies: cognitive, metacognitive, and socio-affective. (O'Malley and Chamot, 1990; Chamot (2004). Direct and indirect strategies from Oxford (1990) were also applied.

Format of online reading test

For this online reading test, the software used can collect individual test takers' total marks and the result of each individual item. The navigation system is simple and easy. The reading passages are easy to read: no color added because of the distraction; test-takers are required to be focused on the test; not too much interaction with the screen. The limitation lies in the fact that test-takers have to scroll the reading text while there should be two windows side by side. The subjective format is available but cannot keep the scores, so they are not used.

2. The validation of the online reading test

The results of reading passages analysis within test specifications

The reading passages have gone through considerable and complex process. The detailed specifications lend themselves to qualified reading passages according to the required level: B1 B2 and C1and within the framework. Thus, we can conclude that the test specifications are the best guidelines for finding the right texts based on reading theory. However, some details cannot be adjusted to the specifications but are still within the framework. The selection of topic is based on the detail of each level whether it requires content knowledge or not, and also the texts that graduate students and academic may be interested in. The following discusses the B1 level in detail as example:

B 1 level, the response methods are similar such as multiple choice, multiple matching. The number of words is somewhat different within 500 words, except for the reading texts in the third set, which are personal and connected. The types of text are exposition and personal. The language covers narrative, description, instruction, narration, classification. The structure of the text is explicit. Structural resources revealed 18, 15.7, and 20.5 words per sentence—somewhat over the specified level (15). The average of Flesch-Kincaid Grade level is 10, 8.6 and 8.2 with 8 as the specified level. The complexity of sentence structure: most simple sentences with subordinate clauses are at the Preliminary English Test level. The cohesion of the three sets of test is explicit. The vocabulary resources for AWL is set at 2.5 %. The AWL of the three sets are 6.32%, 8.51, and 1.81%. The first and the second are academic texts so there are more academic words (most of them are used in Thai), while the third one is a personal story. The nature of content are concrete and the knowledge of content not required. The cognitive of the whole three sets are similar: main point/multiple matching/relevant point/vocabulary in context/pronoun referents. The levels of the reading passages were discussed at the word level, sentence level and intertextual level.

Development process of the test design

This research focuses on the process in developing the standard tests, so the quality of the test is of extreme importance.

The quality of the test is processed thoroughly based on the reading process framework from (1) the design of the online reading test that has evident concept and framework, apparent specifications and details; (2) the evaluation of tests from experts in English, testing, and native speakers; (3) the pilot test of 5 non-informants to preliminary adjust the language and timing of the test; (4) the online test design by experts in electronic learning and software programs; (5) the trial of 31 informants online for statistical analysis and software testing; (6) the quality of the test by *Kuder Richardson* 20 (KR-20)

formula (Test 1 yielded KR 20 = .86; Test 2 yielded KR 20 = .88; Test 3 yielded KR 20 = .61 this revealed the high validity); (7) each individual item was formatted with a variety of formats: 4 alternatives and 3 alternative multiple choice; matching (8) The difficulty and discrimination was accepted at .20 < = p <= .80 — the rest were modified. The matching items adopted the analysis of average mark. ; (9) In adjusting the individual test item: reading process framework, the CEFR level, modification of test items was based on p, r value. In other words whether they are too easy, too difficult or cannot discriminate between good and poor test takers. Percentage of the corrected answer was also analysed. Each alternative was also analysed meticulously such as the good in the group made more mistakes than the poorer in the group. Of all the issues of the validity of the test, Messick (1989) in Khalifa & Weir (2009) insisted that the validity should be taken in terms of degree more than have or have not. In other words, it is relative.

From the above process of quality assurance, the online reading test is qualified as specified.

3. The level of reading ability of test-takers.

Table 1: TEST RESULTS

Set of test	C1 (effective operational proficiency)	B2 (independent user	B1 (independent user
First set	3	12	16
Second set	3	14	14
Third set	2	11	18

The results corresponded to prediction from the English background of test takers who got a bachelor degree and graduate students and from self-evaluation of the test takers (fair more than good) The number of B1 B2 (independent user) test takers was more than C1 (effective operational proficiency). However, this result must be considered in accordance with other factors such as the administration, the marks (Shaw & Weir 2007), and the physical nature of the test room (too cold for some test takers).

4. Strong and weak points in reading ability of test takers

In general, test takers have fair ability in grammar; however, they need to work on the complex and sophisticated sentences. For vocabulary, test-takers are better at each individual word and sentence but not at a discourse level (paragraph).

5. The guidelines for test takers' reading ability improvement

Reading strategies (O'Malley and Chamot 1990; Chamot 2004 Oxford 1990) can be adopted as guidelines. In addition, the test taking techniques (Bachman & Cohen 1998) are useful, especially for tests that will be used to judge the test takers' ability in their jobs.

Recommendation

The findings of the research call for further study on the following: (1) the test-taker characteristics and context validity (2) setting up framework of references for reading ability of Thai students (3) the correlation between reading strategies and test taking (4) a more sophisticated online reading test such as having verbal explanation and sophisticated software.

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DISTANCE EDUCATION TECHNOLOGIES AND TRANSFORMATIVE LEARNING ACROSS BORDERS: RESULTS FROM THREE SINO-AMERICAN ONLINE COURSES

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ABSTRACT

This paper presents what we have learned about the use and effectiveness of distance technologies to support transformative learning activities in 3 Sino-American classes. We address the following questions:

1. How effectively do cross-border classes use distance education technologies to complete assignments in transformative learning communities?
2. Do cross-border distance education classes generate transformative learning communities?

The results of three Sino-American case studies which use similar distance technologies, but with different intensity, to create cross-cultural transformative learning communities composed of American and Chinese graduate students will be compared. We analyzed our efforts to understand how to create and support transformative learning communities across borders using distance technologies. Our results will be useful to scholars in education and other disciplines who are committed to using appropriate technologies to support transformative learning across borders.

INTRODUCTION

This paper addresses educational technology and cross-border transformative learning. According to Garrison and Anderson (2003), a transformative learning community is:

> composed of teachers and students transacting with the specific purposes of facilitating, constructing and validating understanding, and of developing capabilities that will lead to further learning. Such a community encourages cognitive independence and social interdependence simultaneously. (p. 23)

Because online transformative learning entails a very different type of communication than traditional face-to-face learning, a virtual sense of community among students and teachers must be created. Social presence is developed first. Then teaching and cognitive presences are built and used to achieve learning goals. In qualitative research with 30 undergraduate students, Winograd (2000) finds that even a low amount of instructor social presence facilitates community formation. Knupfer et al. (1997) and Bielman et al. (2000) find that structural and behavioral supports are both essential components of an online community of learners. Finally, Young (2004) finds that learning communities in a Chinese online environment provide an opportunity for both students and faculty to learn and for teaching presence to emerge from social interactions among the learners.

Anderson et al. (2001) analyze teaching presence in online learning using three components – design and organization; facilitating discourse; and direct instruction. They find that instructor-prescribed scaffolding, which provides a framework for learning as well as structured exploration, is an essential part of the design of an online community. McManus (2000) suggests that an effective teaching presence will accommodate different teaching behaviors and learner responses. He observes that highly self-regulating students respond best to a non-linear learning environment with few advanced organizers or scaffolds.

Contrariwise, students lacking self-regulating skills learn more when instructors create linear environments with more scaffolding. Graff (2003) finds significant correlations between online teaching behaviors and learning styles. Young (2004) finds that online instructors must be committed to providing learning in a collaborative community environment.

Bentley et al. (2004) summarize cognitive presence in cross-border online learning. For these authors learning in different cultures is a function of cultural norms, accepted learning philosophies, and personal learning preferences. The authors identify eight cultural value differentials that affect online cognitive learning. First, when English-as-a-second-language users are involved in online learning, course materials must explain both linguistic and cultural assumptions in the text. Second, cultural differences influence online learning styles. In some cases technology is more or less acceptable based on culture. Online learning must address differing local needs. What is important to learn in one culture may not be important in another. Learning styles differ and designers must be aware of cognitive values among the target audience. Reasoning patterns also differ with some cultures being more linear and others more non-directional. In addition, status, non-verbal cues and other cultural norms must be understood. Any culture can be placed on a continuum from high to low context cultures. In the case of China and the U.S., China is a high context culture emphasizing group values, while the U.S. is a low context culture where individual values are emphasized. Online learning designed for high context culture may be less effective in a low context culture and vice versa. Finally, rapport and context needs of learners will suggest the most appropriate ways to transfer knowledge. For a North American low context learner, for example, cognitive learning can occur without much cultural context. The same solution would not be as effective in Asia where cultural context is much more important.

There are several studies of the use of technology in cross-border transformative learning efforts. Townley et al. (2002) and Townley et al. (2003) report the learning results of a bilateral team learning class that occurred in 2001. Lim (2003) describes a model of motivational factors that affect cross-cultural learning. Cooper (2003) presents a case study of teaching techniques developed during a nine course sequence involving German and American students in a virtual foreign exchange program. She finds that cultural and linguistic differences are significant and must be addressed. Lajoie et al. (2006) use Garrison and Anderson's model to study a comparative Canadian-Mexican class, finding a similar proportion of cognitive and teaching presences between the two groups.

METHODS AND PROCEDURES

Three Sino-American cases, each representing a different level of curricular intensity, are analyzed in this study: an assignment; a complex assignment; and an entire course. There are commonalities among the cases: the same universities and departments; common educational technologies; similar specific assignments; and one common instructor in all three courses. There are also differences: Chinese and American graduate students; individual work in the assignment case and group work in the other two cases; and different uses of technologies.

The assignment case involved one American and one Chinese education graduate course during a five week period. One assignment for both classes was to draft a paper on multicultural leadership and then to exchange drafts with other class members, domestic and foreign, for suggestions. Second, each student participated weekly in two cross-national bulletin boards, one on leadership and one on socio-cultural issues. The intent was to give each student an opportunity to build teaching and cognitive presence through the paper exchange and to develop cognitive and social presences in the bulletin boards. The cross-national community was intended to be an enriching supplement to existing courses and not require major redesign.

The complex assignment involved one American and one Chinese graduate course for five weeks. It involved Sino-American teams developing a metadatabase describing learning objects to test the SCORM (Sharable Content Object Reference Model) metadata format (Vossen & Westerkamp, 2006). The intent was to provide students the opportunity to generate transformative learning in cross-national communities where teaching, cognitive, and social presences would be used to carry out a real-world assignment. The problem had the following objectives: (1)to review five online learning objects, to understand the definitions of the tables in the standards database, and to make decisions about what information (or metadata) to enter into the database tables; (2) to communicate with cross-national teammates via text-

based chat, email, and two video conferences; (3) for Chinese students to work in a second language (English); and (4) for cross-national teams to devise their own way of working to finish the task in the allotted time. Students met in teams, using both synchronous chat rooms and asynchronous bulletin boards. A videoconference was held at the beginning of the assignment to create Sino-American learning communities and at the end to report outcomes.

The course met jointly for 13 weeks. The course used multiple educational technologies. Readings, lecture notes, taped video lectures, and synchronous online team discussions addressed teaching and cognitive presences. Student teams used the second part of each class to work on a team project intended to address one knowledge management issue in depth and apply it in an education organization. Students met in teams, using both synchronous chat rooms and asynchronous bulletin boards. All of the students participated weekly in three class-wide, asynchronous bulletin boards, each addressing a separate topic: culture, content, and student initiated topics. A videoconference was held at the beginning of the course to initiate the learning communities. Two videoconferences were held at the end of the course to present the results of the team projects. All of these activities addressed cognitive and social presences.

Each case was analyzed in a common manner. Demographic data were collected, coded and placed into a descriptive table. Quantitative data were collected, coded and reported in the text and tables. Qualitative data were collected for all groups from the videotapes as well as archival transcripts of discussion boards, chat rooms, and student webpages. Qualitative data from selected sources were coded using *a priori* categories (Evered & Lewis, 1981) of teaching, cognitive, or social presences (Garrison, et al., 2000; Lajoie, et al., 2006). The purpose of using pre-determined categories was to reduce complexity (Bruner, Goodnow, & Austin, 1972) and determine if the participants successfully experienced the specific context of these presences. As researchers we posed the a priori categories from existing theory and tested the integrity of the categories by continually determining their reliability through further scrutiny of the data. In so doing, it became possible to answer questions that had arisen from the analysis of and reflection on previous data.

RESULTS

Students in the three cases involved in this study are described in this section (Table 1). The location of the students (P.R.C. or U.S.A.), number of students, major, gender, and ethnicity are indicated.

Table 1: Assignment: Student Profile by Major, Gender and Ethnicity

Location	Number of Students	Major	Gender		Ethnicity	
			Male	Female	Majority	Minority
ASSIGNMENT						
PRC-BNU	37	Education	10	27	33	4
US-NMSU	9	Education Administration	3	6	5	4
COMPLEX ASSIGNMENT						
PRC-BNU	24	Information Technology	7	17	20	4
US-NMSU	14	Instructional Technology	6	8	8	6

COURSE						
PRC-BNU	24	Information Science	5	19	21	3
US-NMSU	8	Education	6	2	1	7

The number of students was always higher in the Chinese classes. Students in each class were education or information science majors. Gender distribution and number of minority students was representative.

To determine how effectively cross-border classes use distance education technologies to complete assignments in transformative learning communities, we analyzed the use of three educational technologies used in the courses: (1) asynchronous text; (2) synchronous text; and (3) synchronous video. Each learning community used asynchronous text on a continuing basis. Synchronous text was used in the complex assignment and the course. Synchronous videoconference was used at the beginning and end of the in the complex assignment and course. Each technology is assessed in terms of its effectiveness in teaching, cognitive and social processes.

Table 2: Effectiveness of Cross-Border Educational Technologies by Presence

Technology	Asynchronous Text			Synchronous Text		Synchronous video	
	Assignment	Complex Assignment	Course	Complex Assignment	Course	Complex Assignment	Course
Teaching	Good	Fair	Good	Fair	Fair	Good	Good
Cognitive	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent
Social	Excellent	Excellent	Excellent	Fair	Fair	Excellent	Excellent

For the assignment, students shared two topical asynchronous bulletin boards, their "most interesting journal entry" and "cultural exchange." The journal entry bulletin board had 211 "hits" and the exchange bulletin board had a total of 214 "hits." Asynchronous technology that allowed for student exploration and reflection seemed exceptionally useful as evidenced by the high response rates to the postings.

The complex assignment used asynchronous text as a way for teams to communicate between class meetings. Students were able to transfer cognitive ideas and experiences with the learning objects. Social presence was maintained through personal statements. There were no topical asynchronous bulletin boards. This may account for the comparatively large amount of social presence in the complex assignment (Table 2). The absence of topical asynchronous bulletin boards did not retard the development of the learning community.

The course used asynchronous text technology to support three topical bulletin boards; one on technical definitions, one on cultural topics, and one on student selected topics. Students were enthusiastic about using these bulletin boards for sharing cognitive information and insights. On this technology second language users had more time to compose their thoughts, thereby facilitating discourse. All bulletin boards encouraged exploration and integration in the cognitive presence. Students would post as they explored topics, comparing and contrasting practices in their cultures or disciplines. The other significant contribution of the bulletin boards was to the social presence, where students engaged in affective and interactive behavior.

The complex assignment used synchronous text technology one hour a week in a workshop context. During this time participants engaged in teaching, clarifying and interpreting the assignment for the entire class. Developing cognitive presence in this format had strengths and weaknesses. Language and equipment limitations sometimes led to confusion or misdirection. On the other hand cognitive

breakthroughs occurred and led to rapid acquisition of knowledge. Social presences were effective as students encouraged each others' contributions. Synchronous comments were short and based on specifics. This was effective for team learning related to the applied knowledge in the project assignment, but was questionable in terms of theory. One Chinese student commented: "Synchronized discussion is limited and not flexible. Some information is likely to be ignored."

The complex assignment used four hours of videoconference; two hours at the beginning of the assignment to form teams, and two hours at the end of the assignment to present team reports. The group formation exercise involved teaching, facilitating discourse and direct instruction. Cognitive presence was effective in both videoconference situations, involving all categories in the team formation exercise and integration and resolution in the project presentations. The team forming exercise and the project presentations were successful in initiating and confirming the socio-emotional ties that developed during the course.

The full course used six hours of synchronous videoconference; two hours at the beginning of the course to form and norm teams, and four hours at the end of the course to present group projects. The group formation exercise involved significant social presence. Cognitive presence was effective in both videoconferences, involving all categories in the team formation exercise and integration and resolution in the project presentations. Both team-forming exercises and project presentations were very successful in initiating and confirming socio-emotional ties that developed during the course. A Chinese student observed: "In the course, there are a lot of tools to help us learn together. But I think we need more videoconference to help us communicate more directly.

To determine the extent to which cross-border distance education activities generate transformative learning communities, we analyzed the cross-national learning achieved in each dimension for each case.

Table 3: Transformative Learning Achievement by Presence

	Assignment	Complex Assignment	Course
Teaching	Not achieved	Achieved	Achieved
Cognitive	Achieved	Achieved	Achieved
Social	Achieved	Achieved	Achieved

The assignment case generated a teaching presence in that students provided direct instruction and sparked limited reflective thinking as they evaluated each others' papers. However, the amount of critical thinking was spotty at best. Given this evidence, the instructors believe that teaching presence was not achieved.

The complex assignment did achieve a useful teaching presence. In part, this was due to the intensively transformative nature of the project. Because of physical access to the instructor in the U.S., there was a tendency for American students to provide the teaching presence, passing on information and for the Chinese to respond. As a result, the complex assignment did result in effective teaching within the learning community.

The course also generated an effective teaching presence. Participants provided structure and taught directly in both modalities. Students developed a real enthusiasm to facilitate discourse and teaching and to interact in the videoconference medium. One American student indicated: "Yes! I'm better prepared not only to learn through distance education, but also to teach through distance education. It has been a very valuable experience for me."

Cognitive presence was significant in the assignment. Students learned from each other and were able to develop new knowledge in multicultural educational leadership. This cognitive presence comprised the majority of postings and represents an effective cognitive presence. Comments on each others' papers,

however, were not very successful. This may have been due to inadequate time for the task or a lack of underlying social presence.

The complex assignment was very successful in terms of developing a cognitive presence by using transformative problem based learning. Students used all three technologies with different levels of effectiveness to learn content. Content was transferred, issues debated, and learning demonstrated through useful assessments of metadata potential in education. Even though it is not emphasized in this case, social learning also took place as students discussed the impact of learning objects and metadata across cultures.

Cognitive learning achievement was significant in the course, constituting the major presence dimension for the teams. One Chinese student reported: "I now know how knowledge is used in (educational) organizations." The assignment achieved affective social learning using only asynchronous communication. Students were very interested in getting to know their classmates in the other country.

In the complex assignment, students developed social presence in all three technologies to develop bonds as a learning community. Perhaps the most memorable moment was at the end of the second videoconference when the video camera was used to pan the skyline of Beijing creating audible gasps among the American students. It was a visual representation of the close social bonds that the complex assignment community had achieved.

Social learning was effective in the course. Synchronous conversations that focused on teaching and cognitive content also contained social content. Asynchronous conversations had significant social content. Videoconferences were enormously popular means of social learning. One self-disclosing Chinese student stated: "We are both interested into the other culture and we are both zealous. For example, all of us are active to express our own viewpoint on calligraphy. We learned that the difference is just individual difference, but not social difference."

These three cases represent different experiences in developing transformative learning communities across cultures. The activities generally resulted in the emergence of transformative learning communities. What is sure is that both American and Chinese graduate students are very interested in comparative and collaborative approaches to learning. The concept is new and engaging. This interest makes it possible to increase learning effectiveness using distance technologies.

CONCLUSIONS

The authors conclude that different educational technologies contributed to the achievement of teaching, cognitive and social presence at different levels of effectiveness. They are summarized here in order from more to less contribution.

- Asynchronous technology, in the form of team bulletin boards, was effective for generating teaching, cognitive and social presences across borders.

- Synchronous technology, in the form of weekly online discussions in the complex assignment and course cases, was effective for creating teaching, cognitive and social presences across borders.

- Video conferencing reinforced cognitive and social presence across borders.

The authors make the following conclusions about cross-border learning achievement using distance education technologies in assignments, complex assignments and an entire course.

- There is evidence that an effective transformative learning community was achieved across borders in each of the cases.

- The complex assignment generated a significant amount of transformative learning across borders involving teaching, cognitive and social presences.

- The course also generated a significant amount of cross-border learning involving teaching, cognitive and social presences.

Based on these findings, we conclude that the complex assignment may be the most effective of these three techniques in developing a transformative learning community across national borders. By using multiple assignments and multiple technologies, teaching cognitive and social development is reinforced. By limiting the cross-cultural work to a complex assignment, course-related administrative issues, like calendar differences, tuition and credit hours are avoided. While the other cases are useful and do generate significant learning, the complex assignment seems to work best in the existing technological and pedagogical environment.

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DISTANCE ENGLISH LANGUAGE TEACHER TRAINING PROGRAM FROM DISTANT EFL STUDENTS' PERSPECTIVES: A CASE OF TURKEY

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Abstract

During the past 10 years, distance education has become widespread all over the world. As a branch of distance education in Turkey, Distance English Language Teacher Training (DELTT) program has been offering initial training for prospective EFL teachers since 2000. The purpose of this study was, therefore, to investigate distant EFL students' perspectives of DELTT and identify the factors impeding their positive perceptions of DELTT program and make suggestions for the betterment of distance learning environments. The study begins with an overview of distance education and DELTT program in Turkey. In the methodology section, quantitative and qualitative data collection procedures are presented. A selection of results is elaborated in this paper along with a discussion part focusing on shifting delivery mode of distance education from existent tools to more enhanced tools, students' demand for effective professional support, the prominence of practicality, and factors to be considered for creating successful DELTT programs.

Keywords: Distance education, teacher training, distant EFL teachers

1. INTRODUCTION

Information and Communication Technology (ICT) has remarkably influenced education and training (Ezer, 2005), which has given rise to the emergence of some new disciplines, or study fields, and distance education has appeared as one of the latest forms of education that mainly relies on ICT infusion. Distance education has become as a new and modern approach to present instruction all over the globe, and accordingly, Turkey has strikingly been involved in distance education during the past fifty years. However, distance education in Turkey traces back 1927 when it was first made known in a meeting aiming at maximizing the number of educated people (Alkan, 1987, p. 91).

Unfortunately, it was not practiced in Turkey because of the view that education is not possible without a teacher and a real classroom atmosphere and it emerged in 1970s with a closer meaning of distance education today. In 1982, the Council of Higher Education (CHE) was established to plan, organize, administer, supervise, and regulate all higher education institutions in the country. Following the establishment of the CHE, the Open Education Faculty (OEF) was founded in Anadolu University within the same year because it had sufficient technical and pedagogical infrastructure. In our time, OEF presents a number of undergraduate degree programs to more than 750.000 Turkish students across Turkey, Cyprus and Europe (Demiray, 1999).

The Distance English Language Teaching (DELT) B.A program was established in 2000 with Basic Education Law numbered 2547 to meet the great need for EFL teachers, especially in primary and secondary schools since English courses were incorporated into their curricula in this year (Ataç, 2002). DELT undergraduate program lasts for four years and during the first two years, students are exposed to partially face-to-face instruction for some basic courses such as contextual grammar, oral communication skills, advanced reading and writing, listening and pronunciation and then they have distance education for the last two years. Bates (2000) emphasizes that DE programs worldwide deploy a wide range of technologies that contain two-way interactive and one-way non-interactive delivery of courses. Instruction in distance higher education system in Turkey is dependent on textbooks, television, CD-ROMs and radio broadcasts, which are, in general, one-way non-interactive delivery methods.

The aforementioned teacher training degree program offers three courses related to ICT implementation. Two of them, *Computer I and Computer II*, aim to improve teacher candidates' computer competency and one of them, *Instructional Technology and Material Design*, aims to teach them how to use ICT pedagogically in the language teaching and learning processes. However, the problem is that these

courses are offered at a distance with the help of mostly print materials. Thus, the prospective teachers cannot have the opportunity to experience ICT, which is of paramount importance. With this study, the researcher aims to stress that prospective EFL teachers at OEF need in-class experience with ICT to be convinced of its usefulness and educational value.

2. RESEARCH QUESTIONS

The basis of this curent study is to find answers to the following reserch questions:

1. What are the distant EFL students' perceptions of DELTT program in Turkey?
2. Which factors impede their positive perceptions of DELTT program?
3. What are their suggestions for the betterment of DELTT program?

3. METHODOLOGY

3.1. Sample

The study was conducted with the participation of 85 EFL students at distance English Language education context in Turkey. The participants were in various levels of a 4 year program leading to a bachelor's degree in Teaching English as a Foreign Language. Each participant was assigned a number during the data analysis procedure because of ethical considerations and they were reminded that this research would not be used for any assessment purposes and that personal details would be confidential. Demographic properties of the participants are presented in Table 1.

Table 1. Demographic properties of the participants (n= 85)

		Frequency	Percentage (%)
Gender	Male	39	46
	Female	46	54
Age	20-22	22	26
	23-24	25	29
	25-above	38	45
Year of Education	Fresman Year	9	11
	Sophomore Year	14	16
	Junior Year	25	29
	Senior Year	37	44
TOTAL		**85**	**100**

As the participants have distance instruction during the third and fourth years of their education, they live in different regions of the country.

3.2. Instrumentation

A questionnaire was developed by the researcher to gather data needed for the study rather than using an existing one. The development of the instrument was guided by a number of experts working at higher education settings. This panel of experts including two professors of educational sciences and distance education, one native speaker and two non-native senior EFL teachers evaluated the instrument for content and face validity and contended that the questionnaire was appropriate and comprehensive for the context of the study. To check the realibility, the instrument was analyzed through the Cronbach's Alpha Coefficient $\alpha = 0.90$, which shows high level reliability.

The questionnaire contains nine items based on the 5-point Likert scale (from 1=strongly disagree to 5= strongly agree). Prospective EFL teachers' personal characteristics (gender, age, year of education) were also included into the design of the study to ensure maximum control of variables (Gay & Airasian, 2000). The instrument was designed in English as all participants were known to have a high level of language proficiency, which is a requisite for attending to the ELT departments in the Turkish higher education system.

The questionnaires were administered to the distant EFL teachers at OEF (N=120) through the Internet as they were in separate parts of Turkey during March, 2010. The return rate from the students was 70.8% (N=85). After rigorous analysis of the collected data, 25 of these prospective teachers were contacted again to obtain their phone numbers or chat addresses for the interview session. The purpose of the

interviews was to cross-check students' responses to the questionnaire, to elaborate on their problems and to gather information about their suggestions for the betterment of DELTT program. 80 % of the contacted students (N=20) agreed to have an interview on the phone or on the Internet. These twenty respondents were interviewed throughout three weeks and their responses were transcribed as the researcher had no chance to record their answers. Hence, interview questions contained two items:

1. What are the factors impeding your positive perceptions of DELTT program ?
2. What do you suggest for the betterment of DELTT program?

3.3. Data Collection and Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS. 16). The demographic variables for this study were discrete data (nominal and ordinal); therefore, descriptive statistics were utilized to run for frequencies, percentages, mean and standard deviation (Beins, 2004; Heiman, 2001; Sekaran, 2003).

4. RESULTS

4.1. Results of the Questionnaire

Table 2. Distribution of mean scores on the perceptions of distant EFL students

Items		X	SD
Item 1	I am happy to be a student at DELT program.	3,40	0,49
Item 2	I know that I develop my teaching skills.	2,14	0,35
Item 3	It does not intimidate me to be a distant EFL student.	4,07	0,65
Item 4	DELT program saves my time.	1,89	0,61
Item 5	I feel very confident when I think of my future career.	2,84	0,74
Item 6	I believe that I develop my teaching skills.	3,57	0,77
Item 7	The curriculum of DELT program is efficiently designed.	3,57	0,77
Item 8	I suggest DELT program to prospective students.	2,52	0,50
Item 9	DELT program provides better education than conventional programs.	2,52	0,50
Overall attitude		2,77	0,19

As shown in Table 2, a great number of EFL students at the distance English Language Teacher Training program represented generally disparaging perceptions toward distance teacher training program with a mean score of 2.77 (SD= 0.19). Sixty-eight percent (68%) of the participants exhibited negative beliefs toward DELTT program, while thirty-two percent (32%) of the respondents expressed positive or highly positive intentions in terms of being a student at this program. The most striking result in this section was that the respondents showed no positive attitude toward items 4, 5, 8 and 9. This implied that distant EFL students do not find DELT program saving their time, they do not feel confident when they consider their future teaching lives, and that they do not suggest this program to prospective students. Also, almost all of them were of the opinion that DELT program does not offer better education when compared to conventional programs. On the other hand, eighty-one point four percent (81.4%) of the participants agreed that they do not feel intimidated to be a distant EFL student in the DELT program. Upon investigating items 1, 6 and 7, the results enabled us to come closer to having a respectively positive sense of the participants' satisfaction with the curriculum. Forty-two point eight percent (42.8%) of the respondents consider to improve their skills in their subject teaching as they believe that the curriculum of the DELTT program is efficiently designed.

4.2. Results of Interviews

4.2.1. Factors impeding positive perceptions of DELT program

In response to the first question regarding the factors impeding their positive perceptions of DELT program, they expressed mainly three obstacles as the lack of professional support, exam-driven system, and problems in course delivery methods. The following quotations (presented verbatim) are representative of the views expressed:

"I am learning, in reality, mastering every concept or term included in the books." (Participant 3)

"When I have a question in my mind, I have difficulty in finding a professional to ask it. I must learn everything by myself." (Participant 5)

" I need to do more practice. I may be at a distance but there must be a way of enhancing my practical skills in teaching English as a second or foreign language." (Participant 7)

"While studying at home, I do not feel enthusiastic about learning. Isn't it possible for us to have access to the language classroom with Internet connection for some time?" (Participant 12)

4.2.2. Suggestions for the betterment of DELT program

Regarding the second question related to the suggestions to improve DELT program, they recommended a great variety of changes. From the interviews with the participating distant EFL students, some of the recommendations were as follows:

"Language teachers should be easily reachable so that students can easily ask for information." (Participant 8)

"Advanced communication technologies should be amalgamated into the program. I need professional help when I do not comprehend what is written in the book. In such cases, my friends and I contact another teacher by paying extra money, which is costly for most of us." (Participant 11)

"Books or print materials cannot provide us with the practical knowledge which we really need in our teaching profession. If the book pushes us to deploy technology in language teaching process, we need to experience how it works in the language classroom.' (Participant 7)

"In my viewpoint, factors to be reconsidered can be summarized as the advancement of interaction between the faculty staff and the students, and also among students." (Participant 2)

"The number of students is too many for a faculty. I think, this faculty should change into a university where we may have more academic and technical staff and we may be provided with better opportunities". (Participant 3)

"We can be at a distance. However, we may be presented courses via the Internet so that we can learn better by posing the questions that come to our minds immediately." (Participant 7)

5. DISCUSSION AND CONCLUSIONS

The research focus underpinning the paper was to investigate the perspectives of distant EFL students toward distance English Language Teacher Training Program and to identify factors impeding positive perceptions of DELTT program. On the one hand, the results indicated that students feel ready to employ technology for synchronous or online learning. However, in distance education environment, the view that all the distant students and the facilitators may not be online synchronously and that not all the students may possess necessary foundation have impeded administrators' or policy makers' incorporating synchronous learning into distance education (Altunay & Mutlu, 2008).

The comments unearthed that the delivery mode of distance education must be shifted from such existent tools as television, cassette, and computer software to more enhanced tools, for instance, the Internet (Harper et al., 2004). With the development of large networks in distance education, students may have the chance to deploy communication devices for better teacher to student ratios.

Mossavar-Rahmani & Larson- Daughtery (2007) stress that "smooth and effective communication between students and university governing bodies is one of the key elements in building a successful learning community. Students become frustrated when they need help and none is available, or when they are put on hold for long periods of time" (p. 71). Nevertheless, most of the students are of the opinion that they frequently need professional assistance, especially when they do not comprehend anything included in the books and this lack of communication is a crucial problem in the facilitation of distance education. Thus, this demand for swift and effective support is to be taken into consideration and efforts should gain momentum to preserve the quality of distance English language teacher training program.

In this study, it was also emphasized by distant EFL students that practicality should be attributed prominence so that students can experience how technology works in the classroom and that courses via the Internet should be offered so that students can better learn by asking the teacher the questions coming to their minds immediately. In this respect, it can be stated that students can learn as much as in traditional on-campus courses if distance learning courses are suitably structured and presented (Gagne & Shepherd, 2001).

Finally, as Preston, Cox, & Cox (2000) state, adequate resources, sufficient time, technical and social support are prominent factors for successful training programs as is a focus on the benefits for students' motivation and learning. If DELTT program developers give prominence to these factors, there is no doubt that distance education will allow universities and institutions to achieve four main objectives: to maximize Access, to reduce capacity limitations, to capitalize on emerging marketing opportunities, and to activate institutional change (Oblinger & Kidwell, 2000).

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DISTANCE LEARNING AND INTERNATIONAL COOPERATION. WHAT ARE THE CHALLENGES?

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Abstract
Current literature on Distance Learning is predominately dealing with the technological as well as pedagogical models or its economic, social and cultural dimensions. On the other hand, there is sparse systematic work on the institutional dimension of the construction of policies created by international organizations on the issue.
The objective of this paper is to investigate the role of international cooperation for the promotion of Distance Learning. Distance learning is being mentioned as an important element in the international agenda by a number of multilateral, bilateral and regional organizations as well as by national agencies, private companies and non-governmental organizations. The paper will explore the context within which these actors interact, the challenges that are being posed for transforming the discourse into practice and the potential that international cooperation represents for promoting distance learning.

INTRODUCTION

While there is abundant literature on the theme of distance learning (DL) with regard to the technological and pedagogical dimension as well as its social, economic and cultural impacts, there is sparse literature dedicated to the international dimension on this issue, especially at the institutional level. Thus, there are few systematic studies that trace, examine and analyze the policies and practices concerning DL in international organizations and limited academic production that evaluates the obstacles and opportunities that this activity involves. This occurs due to various reasons. Firstly, the nature of the subject, which is fluid and transversal with multiple impacts in several levels, making it difficult to be categorized. In this way, DL can be found both in an educational policy as well as in a strategy to promote the society of information and knowledge. It can also be traced in the construction of competitiveness, employment, heath and development strategies. Moreover, when it comes to policy making, the emphasis is in the national context with all its characteristics, peculiarities and limitations and the look in the international environment for extracting successful experiences (or not), tends to be left behind. Finally, when it comes to the involvement of international organizations, there is the so-called expectations-capabilities gap, a gap between the expectations created and the real capacity for implementing a policy by an international organization.
The questions "why", "for whom" and "how" permeate the discussion of the construction of international policies and the understandings on how to submit proposals at the national level as well as the process of its local applicability. DL also represents a subject of discussion permeated by both ideological/political and practical nuances. DL has entered the agenda, on the one hand, because of the need to offer and develop “e-skills” so that citizens can meet the challenges of the information society, on the other hand, it represents both a need and an pportunity to use information and communication technologies (ICTs) in a context of great social pressures to access learning. Therefore, at times the terms "learning about ICT and learning through ICT" are mixed (1).
In this context, the present paper aims at offering an introduction regarding the way how international organizations deal with the thematic of DL. The study takes into consideration the position of bilateral and multilateral organizations, as well as private international organizations (multinational companies) and nongovernmental organizations; however, a special emphasis will be given to the United Nations (UN) systems and the EU.

THE EDUCATIONAL CONTEXT

UNESCO emphasizes in its Right for Education, that the access to education is a human right also fundamental for achieving other fundamental rights and that it functions as a catalyst for human development (2).
However, going beyond the declarations regarding the principles that should govern education, in the specific case of the insertion and integration of ICTs into educational systems, a rigorous analysis of the

educational objectives and a realistic understanding about the potential of the technologies used would be necessary, considering the complexity of the matter. An evaluation of the requirements of assessments, and impacts of technologies within the context of educational reform is unavoidable (3).
Since the beginning of the 2000s, the discussion about DL has had its ups and downs in the international agenda. While in some moments it is discussed independently in the agenda of international organizations, progressively it is diluted in broader agendas, which vary in scope and final purpose. Thus, DL has become a part of broader international strategies. This is not necessarily something negative because it proves its thematic transversality and complexity. However, it can occupy a secondary position if the actions are fragmented without considering the set of initiatives developed in many sectors of international organizations.
Haddad and Draxler (2002) identify four major challenges to be confronted in today´s technological environment. First, the rapid generation and dissemination of knowledge, not only at the high sophistication level, but also in the activities developed daily, which will create a technological dependence and a need for creating new skills to cope with constant and not equitable change between countries. Second, the growing awareness regarding social issues such as democracy, peace, people's empowerment, freedom of communication, culture, civic participation, gender equity and quality of life. Moreover, development goals are not tied simply to the economic dimension, they embody goals such as reducing poverty, improving health and education, and sustainable development, according to those mentioned in the Millennium Development Goals. Finally, that education is a central subject to achieve economic and social development, and environmental sustainability (4).
The same emphasis on sustainability was given during the World Economic Forum in 2010, which launched the Global Information Technology Report 2009-2010: ICT for Sustainability. The report argues that the initial positive signs of the global economic recovery also counted with the contribution of ICTs, since they play an important role in modernizing societies, in improving the living conditions, and in decreasing the digital gap within and between countries. The report creates an index of connectivity, in which Brazil appears in the 61th position, considered "stable" to the authors (5).
It also revealed the limitation of the current understanding about education and the demand for a new structural framework around the term education, which goes beyond rigid and traditional models. Models that cannot offer the necessary flexibility and sustainability to deal with the complexity, the ambiguity and the constant change of contemporary life. In this light, it is drawn a timeless and desirable concept for DL, i.e., DL must be coherent as a process that emphasizes the construction and socialization of knowledge, promoting to anyone, despite time and space, the possibility of becoming agent of learning due to the use of different resources and media, and according to economic/social ability, cognitive models and forms of interaction, always permeated by collaborative/cooperative work. The concept is not the premise to analyze the international scenario that this article addresses, but should be seen as where one can reach if consider the diversity of scenarios of human and social order, to which education (DL as well) need to look, to obtain efficiency.
There are many contexts involving different people employing distinct technologies, so the legal models, as well as the partnership models, cannot be restrictive, favoring one or another culture, at the risk of becoming myopic in relation to the enlargement of the inclusion specter for which they are intended.

LEARNING TENDENCIES ASSOCIATED WITH DIGITAL TECHNOLOGIES AT THE INTERNATIONAL LEVEL

The 2011 Horizon Report identifies a number of macro trends that characterize the learning environment at the international level. First, there is the proliferation of resources available through the Internet. The access to Internet contents available through equipments of personal use, such as the mobile phone; the growing number of open contents; and, the variety of e-books demonstrate that knowledge goes beyond the capabilities offered in a school or a campus, which encourages the educators to think in new ways to interact with those looking for learning. Second, there is the expectation to work, study and learn anywhere, anytime. Again, the availability of Internet access offered in mobile phones contributed to the increase of this expectation. Third, the work world is changing, becoming more collaboratively to solve complex problems with global impacts. Solving these problems requires the assistance of several teams in different geographic locations and technology contributes as an ally to facilitate this interaction. Finally, the process of technology decentralization and the new spaces to deposit "cloud based" content impact on decisions related to the adoption of certain technologies for learning, and also shows the importance of discussing issues regarding privacy and control of use thereof (6).
All the more rapidly, social networks show the non-measurable strength of a global or network society and the need for a systemic approach. Phenomena such as the Facebook, Orkut, LinkedIn or Twitter

freely demonstrate the people's need to be constituted as a group for a social, emotional or even economic and social existence. When communication is extended in a timeless way, in any language, with any form of expression, without restrictions categorized by gender, sex or social group, the membership becomes omnipresent, without modulation or boundaries, providing atmospheres for any type of transactions, including learning.

International Cooperation

In addition to the nongovernmental organizations perception on macro trends for the advance of learning through the use of information technology, many countries included in their international agenda the DL issue as an instrument of international cooperation. At the bilateral cooperation level, there are considerable contributions for the discussion, construction, and implementation of e-learning policies and projects from countries also known as the donors of international assistance (Overseas Development Assistance - ODA) for developing countries. The channels for this contribution vary. Cooperation can be allocated directly through national offices of international cooperation (Ministry of Foreign Affairs, International Development Agencies etc.), or in organizations of multilateral cooperation (UN system including UNESCO, the World Bank, and IDB), as well as through regional structures of cooperation in which they are members (EU, MERCOSUR, OECD), and other international initiatives such as the World Summit on the Information Society, the Global Alliance for ICT and Development Policy, and the World Education Forum. The instruments to implement these policies also vary and include both the allocation of non-refundable resources and financing through credit lines, as well as institutional support to authorities which request support in this area and participate in discussion spaces for expanding partnerships and building transnational networks.

Bilateral Cooperation

Thus, there are organizations like the Canadian International Development Agency (CIDA) and its strategy entitled Knowledge for Development through Information and Communication Technologies, and the suggestions from the Canadian government for reducing poverty through the use of ICTs. The Department of Foreign Affairs and International Trade of Canada has a specific unit to encourage practices that use ICTs. The Danish International Development Agency (DANIDA) established the country's principles for cooperation in the field of international assistance for development, and created a space to present the best practices in the area of ICT. Likewise, the German government has elaborated a set of guidelines for international cooperation in the area of ICTs. Other countries, like Ireland, also created a task force to deal specifically with cooperation issues in ICT, in addition to their general policies of international cooperation already established. The Swedish International Development Cooperation Agency (SIDA) incorporates its ICT strategy with the process of reducing poverty through the diminishing of the digital divide. The Swiss Agency for Development and Cooperation (SDC) also operates in a similar way, prioritizing programs and projects for poverty reduction in Asia, Africa, Latin America and the Caribbean through technological instruments. The Agency also created a portal of best practices, and a space to discuss the challenges offered by ICTs in developing countries. In the United Kingdom, the Department for International Development (DFID) also prioritizes the use of ICTs for reducing poverty.

Multilateral Cooperation

In the context of multilateral organizations, there are major initiatives such as the Millennium Development Goals (MDGs), which involve the whole UN system and the international community. They offer an indicative regarding the mainstream of the learning thematic which is reflected in the eight goals that include from the implementation of universal primary education, and the promotion of gender equality to health and environmental sustainability themes. For the implementation of these goals, it becomes necessary a learning process in which ICTs have a major contribution (7).

UNESCO plays a central role within the UN system in constructing policies, capabilities, and training in the area of formal or informal education. It also has developed a set of tools to evaluate the effectiveness of the methods used. Along with other UN agencies such as UNICEF, the World Bank, the Population Fund, the World Health Organization, the Food and Agriculture Organization and the United Nations Development Programme, UNESCO also participated in the creation of the global movement Education for All. The movement, taking as background the 2000 World Education Forum during which the Dakar Framework for Action was elaborated and its Action Plan, suggested six regional plans to be implemented until 2015 in order to stimulate our collective responsibility to ensure a quality, inclusive and lifelong education. In its final report, the action plan makes a special reference to the importance of

ICTs as a key factor for teaching and learning and identifies as a crucial actor to achieve these goals, the involvement of national governments (8).
In 2001, the United Nations Information and Communication Technologies Task Force was created aiming at contributing to build educational ICT policies within the UN system, putting technology at the service of development. Among the activities of the Task Force is the creation and the promotion of the Global e-School and Communities Initiative (GeSCI), which aims at implementing strategies at the local, national, and international level for the use of technology for educational purposes and seminars organization, which resulted in the production of documents emphasizing the importance of using technology for learning (9).
Another initiative represents InfoDev which is a program managed by the World Bank responsible for building ICT policies for development. The Global Distance Education Network (Global DistEdNet) offers a set of resources for educators and policy makers (10). InfoDev also produces a series of "maps" regarding the use of ICTs in education. The maps are divided into four categories, comprising impacts, costs, implementation and planning areas. However, a number of questions have arisen concerning the use of these instruments. There is a lack of consensus regarding its methodology and its performance appraisal as the maps' evaluation does not demonstrate the impact of usage of these technologies. (11).

European Union
In the European Union extent, a set of ambitious actions was designed to expand and strengthen the e-learning. One result of the board of the European Council of Lisbon in 2000 was the creation of an initiative for accelerating the use of the Internet and multimedia technologies in the European education. The action plan mobilized not only educators, but also the civil society and the private sector to become involved in building the information society. Subsequently, the portal for e-learning was created and the program with the same name was initiated, aiming at using technology to foster learning, to embrace life and to promote the modernization of technologies needed to achieve this goal. The program disposes four priorities: digital literacy, development of virtual campi, promotion of virtual union in schools and the promotion of e-learning in Europe.
The Bologna process for creating a European space of education recognized the e-learning as an indispensable tool for the construction of this space. Thus, a series of programs such as Leonardo da Vinci, Comenius, Grundtvig and the Minerva action in the Socrates Program were dedicated to the use of ICTs in education. These actions were further complemented by an e-learning transversal action to take DL ahead of schools and universities, entering the life of European citizens with the proposal of training and qualifying for life.
In the specific case, the reduction of direct references about the DL can be explained by a focus deviation in the European strategies from educational policies to a security agenda. It can also be attributed to the resistance of educators that relied themselves on the ambiguity of policies regarding the DL manners of delivery.
On the other hand, the European Commission, within its strategy for building a global role in the international context, has created a series of external cooperation instruments that include e-learning. The Directorate of Cooperation and Development (EuropeAid) is associated with activities of international cooperation and serves through instruments of cooperation for development (DCI) (12). In the specific case of cooperation with Latin America, many of the regional programs offer a direct or indirect opportunity for the inclusion of a DL dimension. Programs such as the Alliance for the Information Society (@LIS2) aim at reducing the digital gap, contributing to the integration of South America in the global information society. Currently, in its second phase, the program seeks to stimulate the interconnectivity through a dialogue extension between the two sides and the instruments of cooperation. The program allocates non-refundable resources up to 70.4% of the envisaged activities of the approved proposals.
The ALFA Program, currently in its third phase – ALFA III –, co-finances activities for the strengthening and the promotion of economic and social cohesion through networks of higher education institutions. The two calls for proposals in this program exceed a total of €50 million in resources, considering that 80% of the activities are sustained by the European Commission.
Despite being a program designed to foster internationalization of small and micro enterprises, AL-INVEST offers the opportunity to develop initiatives which may include distance training courses, virtual events and exchanges of best practices among other activities. Currently, in its fourth phase and with a budget of €50 million, AL-INVEST operates through three consortia, one of them led by the Brazilian National Confederation of Industry.

Among its priorities, the EUROsociAL program also co-finances innovative practices to improve social cohesion, while the URB-AL promotes cooperation of local government through the construction of agendas with themes regarding common challenges of the EU and LA. New programs launched recently, like EUrocLIMA and RALCEA, which will prioritize themes related to climate change and water management, also provide space for educational action, and distance training.

In addition to the initiatives of regional international cooperation, the emphasis on digital dimension becomes even more evident in the sub-regional cooperation with MERCOSUR, in which projects like MERCOSUR Digital, MERCOSUR Information Society, MERCOSUR Mobility, MERCOSUR Audiovisual, and the program of institutional support for MERCOSUR show clearly the EU understanding that the efforts to consolidate the process of regional integration can be optimized through ICTs and DL (13).

Other initiatives derived from distinct boards can also be identified, as the 7th Framework Programme in the area of Research and Innovation. The program represents the largest funding instrument for research, innovation and technological development in the EU (14). The transverse nature of DL are also visible in the EU attempts to create an integration policy so that the European programs can encourage the use of ICTs for e-learning in all the segments of educational systems.

All these organizations highlight the potential use of ICTs in education or, more specifically, in DL. However, in parallel, they also highlight the challenges to be overcome. From a theoretical point of view, but also from a strategic perspective we have seen that the transformation of the learning process is questioning the traditional understanding of time, space, forms and purpose for constructing, accessing and delivering knowledge. The rapid generation, high sophistication and wide dissemination of knowledge requires a new set of skills for dealing not only with the technological or pedagogical aspects of learning but with the creation of a systemic consciousness involving the need for structural changes in education that go beyond the current rigid models of learning which are not able to offer the necessary flexibility and sustainability for leading with the complexity, ambiguity and constant change of contemporary life. The International Organisations, acting within this environment apart from taking into consideration these factors also face the need of internal restructuring for responding to these developments if not anticipate them. From the point of view of policy construction, a set of challenges can be identified at the structural level starting with the absence of reliable data and information to create policies both in the international as well as national level that take into consideration the needs of different target audiences. The creation of macro policies and the achievement of macro goals for inclusive, relevant, efficient, and quality education for a global society has to take into consideration economic and social contradictions, variable technological access, different legal and political scenarios, budgetary limitations and distinct human capital capacities. Going beyond that, this new era of information/knowledge and relationships perhaps the greatest challenge these organisations are facing is expanding their understanding to include the technologies/relationships dimension because it is in the relationships network that the survival and the sustainability of species and of the planet are consecrated.

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DO PERCEPTIONS INFLUENCE USE OF EDUCATIONAL TECHNOLOGIES? A CASE OF MAKERERE UNIVERSITY STUDENTS

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ABSTRACT

Universities across the globe now appreciate the fact that higher education is facing challenges of limited funding, increased students populations and the need to maintain quality. They also appreciate that the use of Educational Technology can be one of the ways to overcome these challenges. As a result, efforts to integrate ETs in the teaching, research and learning functions of the university are now supported with improvement in infrastructure.

Unfortunately, students are not fully taking advantage of the gradually improving Technological environment to improve their learning experiences. Differences have been noted in students' use of Educational technologies (ETs) but little is known about the way they perceive ETs and how this could affect and explain existing forms of access to and use of ETs in leaning.

A sample to 200 undergraduate students from Makerere University was selected using a stratified sampling method to participate in the study. This cross sectional study employed both qualitative and quantitative methods of data collection. In the survey, Likert scale questions were used to measure students' perceptions while content analysis was done to interpret and analyse qualitative data. This paper found out that students formed perceptions both positive and negative about ETs. Majority of Negative perceptions – like ETs are time wasting, resources from the net are sketchy (not detailed enough) do not support use while the positive perceptions promote like Internet provides easier access to current and useful academic information, computers can be used for typing academic work support use. However, positive perceptions are many times shattered by a number of challenges that students said stand in their quest to access and use Educational technologies for learning.

Keywords: Education Technologies (ETs), university students, perceptions of ET & use, Makerere University and use of ETs

INTRODUCTION

In this century, Institutions of higher learning are convinced that the use of Educational Technologies (ETs) will help universities not only to over come the persistent challenges of reduced funding, increased students populations and the need to maintain quality amidst insufficient facilitation but will also create a student with life long learning skills appropriate for the changing and global labour market (Agbonlahor, 2005; Tyler, 2005).
Due to liberalization of the education sector, there has been an increase in enrolment and the number of higher educational institutions in Uganda. By the year 2010, there were 21 universities, five of which are public institutions while the rest are private. The expansion of University education has been in response to the burgeoning demand for higher education evidenced by an increasing number of students in Higher Educational Institutions (HEIs) in the country.

Makerere University, established in 1922, is the oldest and largest public institution of higher learning in the country. It increased student intake in the early 1990s and over the years, the student numbers have grown phenomenally. By mid 2010, the university had a student body of about 18,000 female and 22,000 males with an infrastructure whose growth pace has lagged behind that of student enrolment.

Technology enhanced learning environments are arguably key enablers of delivering efficient mass higher education (Agbonlahor, 2005; BBC, 2007; Tyler, 2005). Makerere University argues that technology can increase quality and productivity as well as accessibility to higher education. With the need to address increased demand for higher education amidst over-stretched infrastructure, Makerere University has placed substantial hopes in the integration of technology in the teaching, learning and research activities. The university crafted the ICT policy (2005) and a draft strategic plan for Educational Technology (2007) is in place with a mission to ensure "University-wide access to and utilization of Educational Technology to enhance the position of Makerere University as a centre of academic excellence and its contribution to the sustainable development of society".
The problem however is that students are not fully exploiting the opportunities of utilizing ETs to enhance their learning experiences and outcomes.

PURPOSE OF STUDY

Both men and women form perceptions on ETs, which may be influenced differently by gender. As such, this study explores how male and female students perceive ETs. Resultantly the study examines the effect of the differentiated gender perceptions on the acceptance of ET in Makerere University. This study therefore sets out to investigate students' gender perceptions on Educational Technologies and establish what students'

perceptions are and how they influence use of ETs in Makerere University. This aspects form the core of research questions for this study.

METHODS AND INSTRUMENTS

In this section we present the study design, sampling design, methods used in data collection and analysis as well as the Instrument used.

Design

A cross - sectional research design was employed and the variables of perception, access and use of ET among university students were measured.

Study Population

The study respondents were undergraduate students drawn from 61 departments of the university. Care was taken to have at least one female and one male student in the sample. Respondents were selected following a multi stage cluster sampling method were different academic units were clustered into mainly three groups: Sciences, Humanities (Humanities composed of Arts, Economics and Management, Law, Psychology, Social Sciences and Languages; Sciences include Agriculture, Computing and IT, Forestry, Statistics and Applied Economics, Science, Technology, Veterinary Medicine, Library and Information Science, Environment and Natural) and Education (- consisted of Education and The Institute of Adult and Continuing Education).From these three clusters two respondents – one male and female student were randomly selected. A total of one hundred and twenty two students participated in the study.

Data Collection Methods

A survey with the use of a semi structured questionnaire (see appendix 1) was used to collect quantitative data from the 122. in addition, three FGDs (one mixed and 2 single sex groups) with the help of a focus group guide (appendix 2) were conducted to collect data for the study.

Data Analysis

Processing of data for analysis involved data editing and cleaning where errors detected in the returned questionnaires were eliminated; data categorizing; data entry and presentation.

Results

Both men and women form perceptions on a multitude of issues. In the area of ETs, perceptions can be formed about its definition, access as well as usefulness among others which may be influenced differently by gender. As such, the study explores how male and female students perceive ETs. Resultantly the study examines the effect of the differentiated gender perceptions on the acceptance of ET in Makerere University.

Educational Technologies (ETs) have been defined differently by the different scholars that cared to make a contribution on what ETs mean. In this study, students were asked to choose from the two definition statements, one that they, as respondents perceived to be the

most acceptable definition. If none of the two was close to what they thought was a good definition for ETs, then they were to state their own version of an alternative definition. The two provided statements were tested on a likert scale with five measures from strongly agree as 1 up to 5 strongly disagree as shown in Table1:

Table 1: Students levels of agreement and Perception of ET definition for in (%)

Definition Statement	That ET is the field concerned with the design, development, utilization, management, and evaluation of processes and resources for learning (Luppicini, 2005).									
Measure	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree	
Scores	FQ	%	FQ	%	FQ	%	FQ	%	FQ	%
Male	12	50	11	45.8	1	4.2	1	.8	1	.8
Female	9	52.9	7	41.2	1	4.2	3	2.7	2	1.8
Totals	21		55		23		4		3	
Definition Statement	Educational Technology (also called Learning Technology) is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources (Wikipedia)									
Measure	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree	
Scores	FQ	%	FQ	%	FQ	%	FQ	%	FQ	%
Male	31	67.4	15	32.6					**NG**	
Female	26	54.2	22	45.8	0					
Totals	57									

Source: PHEA Gender Research Data, 2010 NG _ not given FQ – frequency

As seen from table one both male and female students' agreed more with the second statement about ETs than with the first. The study also revealed that only one of the female and male students were not sure among those that considered the first statement about the definition of ETs yet in the second case, all those that answered were sure of what ETs meant to them.

Some of the students who did not perceive ETs as suggested in either of the two definition statements provided alternative definitions during the survey:

Two male students and one female said ETs are for research and typing; One female student said ETs refers to the equipments or gadgets e.g. laptops, desktops which help in teaching, learning and research; ETs are the Aid used in Teaching and learning for example Computers and Radios. While, during the Focus group Discussions (FGDs) perceived

definitions of ETs are summarized in table 2 indicating definitions drawn from the three groups i.e. from the male, female and mixed FGD.

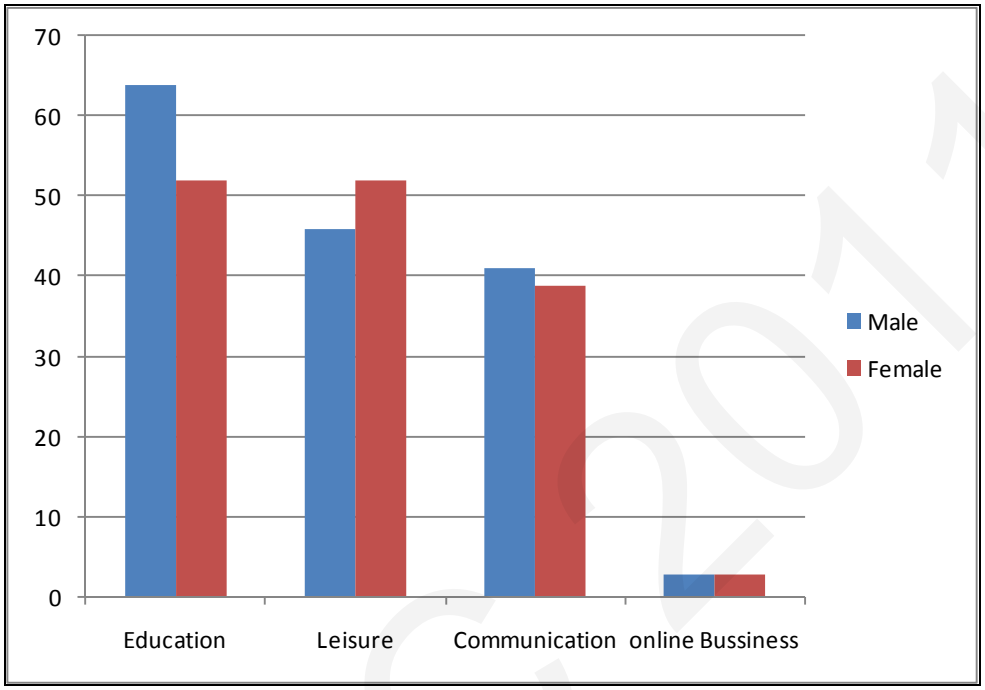
Table 2: Summary of Definitions generated during the FGDs

Male FGD	Female FGD	Mixed FGD
• Approaches, technologies or ways that have been used or developed to make the teaching and learning process easy and a success • The use of information technology as a source of educational resources • It involves imparting knowledge into individuals by the use of technology or equipments in the entire period of learning and teaching • The use of new innovations such as the Internet, phones • Ways in which education is facilitated through use of both Communication and Information Technology	• Learning done with a particular technology	• Human innovations that ease transfer and acquisition of knowledge • Involves use of modern implements in the process of formal learning. • Tools for learning e.g. projectors, computers

It is exciting and interesting to note that students perceive ETs as new innovation tools or equipments used in the learning process basically to aid the transfer and acquisition of knowledge.
Under this they listed computers, Internet, projectors, radios and Mobile phones. Although students use mobile phones mainly for communication, they also recognized them as an ET.

Because of what students perceived ETs to be, they thus used them for Academic purposes like in researching for information as well as typing out assignments. In addition, ETs were also used for communication and entertainment as shown in figure 1.

Figure 1: Use of ETs by Male and Female Students in Makerere in %



Source: summarised from PHEA, Makerere Gender Research data, 2010

Discussion and Conclusion

The aim of this research was to establish students' perceptions about ETs. Some of the research questions asked were: How do University students in Makerere perceive / define ETs? Which technologies available to them are perceived as ETs and lastly how their perceptions influence use of ETs. Universities have recognized the value of integrating use of ETs especially to curb effects of reduced funding, increased demand for higher education, over stretched infrastructure and the need to boost and maintain quality (Agbonlahor, 2005; BBC, 2007). As such policies and strategic plans have been drawn (Makerere, 2001; MakerereUniversity., 2009); ICT infrastructure improved all to support the use of ETs in teaching, learning and research activities -the three core functions of a university. The ideal is that ETs can and should be used to enrich the learning experiences (Yucel, Acun, Tarman, & Mete, 2010). Students in their perception of ETs recognize mainly computers, Internet and mobile phones as ETs that add value to their learning. Other technologies mentioned were specific to disciplines for example sciences with mounted skeletons, batteries and the general ETs like the projectors. Because students perceive ETs as new innovations, they thus do not recognize ETs that have been around for some town among these are musical instruments, televisions and radios.

In conclusion we think students perceptions on what ETs are and their value to their learning experiences greatly influence usage.

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DOES A COMBINATION OF METAPHOR AND PAIRING ACTIVITY HELP PROGRAMMING PERFORMANCE OF STUDENTS WITH DIFFERENT SELF-REGULATED LEARNING LEVEL?

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ABSTRACT

This study aims to investigate the effects of metaphors and pairing activity on programming performance of students with different self-regulated-learning (SRL) level. A total of 84 computing students was involved in this seven-week study, and they were randomly assigned either to a group that received a combination of metaphor and pair programming (MPP) or to another group that received pair programming (PP) only. Students in both groups worked in pairs according to their SRL level (one high and one low) when solving programming problems in C++ language. The findings revealed that high SRL students in the MPP method performed significantly better in recall than their peers in the PP method, and similar result was observed among the low SRL students. However, no interaction effect was observed between the method and SRL level on programming performance, i.e., high SRL students always perform better either in the MPP or PP groups. Metaphors have assisted the learners to develop better conceptual understanding by linking the known to newly acquired abstracts; and pair programming does cultivate peer discussions. Also, instructor should assist students to improve their SRL to reinforce self learning.

Keywords
Metaphors, Self-Regulated Learning, Recall Performance, Pair Programming, Computer Programming

INTRODUCTION

Computer programming as part of the computing education is an essential skill that ought to be grasped by students in studying computer science. As programming demands complex cognitive skills, students find it difficult to understand, interpret and perform these complex cognitive tasks (Hawi, 2010; Mayer, 2003). Likewise, educators involved in teaching programming concepts to first year computing students are continually facing different challenges in cultivating the students' understanding in the fundamental area of semantics which is the programme comprehension. Miliszewska and Tan (2007) stated that complex cognitive skills such as planning, reasoning, problem solving and analytical thinking play their role in learning to programme. Problem solving skills which include reasoning and analytical thinking are required in analysing the given problem scenario. During the learning process, students are required to understand the given problem, design, coding and perform maintenance that involve complex cognitive and social activity. To the first year computing students, majority of them believe that programming skill is complex and difficult to learn. However, those who are passionately interested in exploring the abstract problems find themselves motivated in acquiring the programming skill. Usually, these students are actively engaged in class activities and during lectures while the programming topics are covered. Somehow, they are able to seek help and discuss problems relating to programming. As such, effective learning takes place when students are learning through positive peer pressure in a fun and joyful environment as well as to reflect on self-learning outcomes by comparing them to the initial goals. Furthermore, higher thinking skill is needed in order for students to be the creators of new ideas, analyzers of information and generators of knowledge which seem lacking in these students (Butler & Morgan, 2007).

An earlier research on cultivating thinking and problem solving skills within students has been carried out when Pseudocode and program flowchart are mainly focused on the basic programming constructs (Tie, 2011). Besides teaching programming concepts, educators have tried in vain to cultivate the skills such as critical thinking, analytical and problem solving which are crucial to students who intent to take up

programming career. Over emphasizing on the program syntax and semantics of individual statements will lead to the students' misunderstanding and inability to construct a complete working system which is the pragmatics. Despite the fact that students could recognise the syntax and semantics errors in the program flowchart or Pseudocode, they might not notice the logical errors. Foremost, these students find it a challenge when they were asked to convert the programming logic (in the program flowchart or Pseudocode) into executable programming codes in C++ language.

LITERATURE REVIEW

Metaphor is a high level abstract concept that involves the presentation of new idea in terms of relating it to the existing knowledge. It is significant to assist the formation of interpretation and application of knowledge from the basic programming concepts acquired. Mastering the basic programming skills is fundamental for preparing learners to the next higher programming courses. Metaphors play a significant role in helping learners to develop mental images to reason abstract situations. They are being described as a real world system which the students are able to apply as a reference for linking existing ideas to the newly introduced concepts in programming system (Parker, 2009). The metaphor is expressed into either visual or textual representation in relating the abstract nature of the programming tasks to the fundamental of programming concepts. In this case, students are to transform these abstract concepts into logical flow by using designing tools such as program flowchart and Pseudocode before converting it into C++ programming codes. By connecting any concrete images with text information it will improve understanding in learning programming and increase the learners' recall (Flanik, 2008). Subsequently, it assists in enhancing programming comprehension and better academic performance. Three conceptual metaphors (Figure 1, Figure 2 and Figure 3) are three examples used to illustrate the C++ syntax in learning programming.

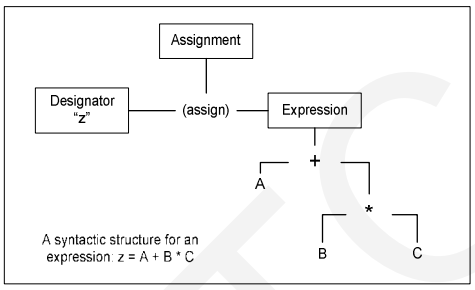

Figure 1. An symbol expression tree formed for assignment (adopted from Merwe, 2008)

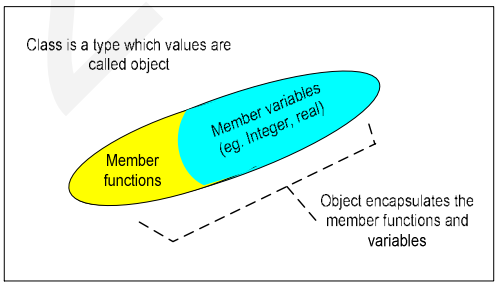

Figure 2. Medical capsule representing classes

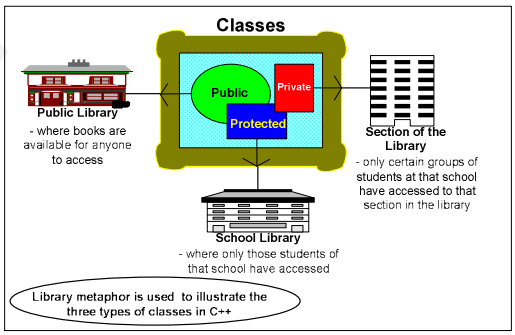

Figure 3. The library metaphor – explaining the "class" concept

Pair programming is a structural and systematic form of programming cooperation. It has been adopted in software industry to increase programmers' productivity and programming skills, where programmers work together in groups to complete the assigned tasks (Chung & Lo, 2006; Beck, 2000); and in education to increase learning. Research findings revealed that students perform better in terms of producing higher quality of codes, increasing retention rates, as well as improving problem solving skills and attitude towards programming when working in pairs (Bruce & McMahon, 2002).

Self-Regulated Learning (SRL) has been defined as a process in which the students set goals for their learning. This includes planning and carrying out certain strategies for the achievement of the goals, and to independently manage time and effort, and evaluate the quality of their own learning environment (Zimmerman, 2000). The students' level of SRL ability, high or low, is based on the group mean measured using the Motivated Strategies for Learning Questionnaire (MSLQ) instrument developed by Pintrich and DeGoot (1990). Studies have shown a significant correlation between an individual student with a high level programming performance and his high-quality involvement in SRL (Zimmerman, 2008; Lee, Shen & Tsai, 2008). In fact, the high SRL students are those who are highly involved in independent learning (Reyero & Touron, 2003). These students have the ability to regulate learning towards a desirable learning outcome and the skill to manage and organize their own learning needs, strategies and learning opportunities. The students with higher level of SRL ability are capable of building their own conceptual metaphors when new ideas are presented. By relating the existing knowledge and experiences to the newly introduced concepts, these highly self-regulated students are competent to set their learning goals based on own expected learning outcomes. When feedbacks and constructive criticisms are obtained from lectures, these learning strategies will be refined to ensure effective learning with positive outcomes.

RESEARCH QUESTIONS

In this study, three primary questions have been formulated to address the research outcomes:

1. Is there any significant difference in terms of recall performance for high SRL students who received a combination of metaphor and pair programming (MPP) treatment and those who received only the pair programming (PP) method?
2. Is there any significant difference in terms of recall performance for low SRL students who received MPP treatment and those who received only the PP method?
3. Is there any interaction effect between instructional methods and self-regulated learning level?

RESEARCH METHODOLOGY

The purpose of this study is to investigate the effects of blending the metaphor with pair programming strategy on the programming recall performance among high and low SRL computing students in learning programming constructs through C++. It aims to examine whether the different levels of SRL could be the moderating factors when an instructional strategy such as (i) metaphors as visualisation techniques, and (ii) pair programming as cooperative learning, are used in both classroom and practical sessions during course delivery.

Research Design

A 2 x 2 factorial design was applied to examine the effects of MPP and PP instructional methods on the students' recall performance. In this case, the self-regulated learning level (high and low) was used as the moderating variable. The students' recall performances were measured based on the immediate post-test scores obtained from the Computer Programming Performance Test (CPPT). A total of 84 students (n = 84) from the first year semester one undergraduate computing course were involved in this study. These two classes, all intact groups, were randomly assigned to the two treatment groups. The experimental group (n= 42) received the MPP treatment while the control group (n= 42) was treated with the PP method. For this study, the course comprises lectures and practical / tutorial sessions. During the lecture session, the students were given the explanation on some programming concepts using tools such as flowcharts and Pseudocode, while during the tutorial or practical session, the students used the C++ language for coding.

Research Instruments

Prior to the study, the Motivated Strategies for Learning Questionnaire (MSLQ) was used to identify the students' self-regulated learning level. It consists of 23 items that requires 20 minutes to complete. In this study, the MSLQ mean score of the sample was 3.50. Students who scored 3.50 and above the group mean were categorized as high SRL and those who scored below 3.50 were classified as low SRL. A CPPT pre-test was administered to the participants prior to the treatment. An immediate post-test of

CPPT, covering both theory and practical knowledge was conducted immediately after the treatment to gauge the students' programming recall performance. Prior to it, a set of reliability tests were conducted on the instruments used in order to determine the Cronbach's Alpha reliability coefficients. The reliability values of instruments are: (i) 0.915 for the pre-test, and (ii) 0.954 for the immediate post-test.

Data Collection Procedures

The first year semester one computing students in the two intact classes were involved in the seven-week experimental study. They were randomly assigned to the two treatment groups. The students in the first treatment group (MPP) received the combination of metaphors and pair programming instructional strategy in learning the basic programming concepts. In the control group (PP), the students were exposed to PP as the cooperative learning instructional strategy in solving the programming problems. To understand the abstract concepts, the students in both groups were taught using programme flowchart and Pseudocode. During practical session, they were to apply C++ programming language in converting these logical concepts into working programme codes.

The students in both the experimental and control groups were paired and each member of the pair was randomly assigned with a role, either as a driver or a navigator. The explanation regarding the roles (driver or navigator) of each member in the pair was given to both the MPP and PP groups. On every programming problem, they were persistently required to cooperate on the same design, algorithm, coding and testing. The role between the driver and the navigator was switched periodically. The experiment was carried out for seven weeks. The immediate post-test was administered to both groups immediately after the treatment. The CPPT instrument was used to measure the students' recall performance of the computer programming knowledge.

RESEARCH FINDINGS

In this study, SPSS 17.0 for Windows was used to analyse the scores collected from the two CPPT namely the pre-test and immediate post-test. The ANCOVA statistical technique was applied in order to determine any significant difference between the students with different self-regulated learning level on their programming recall performance. In this case, the pre-test score was used as the covariate.

The analysis results are shown in Table 1 and Table 2. Table 1 reveals the ANCOVA findings, while Table 2 shows the descriptive analysis and Table 3 indicates the post-hoc results. The interaction effect between the treatment groups and SRL is shown in Figure 4.

Table 1. ANCOVA Results for the Recall Scores of the Two Treatment Groups

Dependent variable	df	Mean square	F	Sig.
Recall (immediate posttest)	3	1102.28	37.96	0.00*
Group * SRL	1	68.20	2.24	0.14

*significant at 0.05 level

Table 2. Descriptive Statistics for the Recall Performances of the Two Groups with Different SRL Levels

	Groups	SRL	N	Mean	SD
Recall (immediate post-test)	MPP	High	24	74.17	4.08
		Low	18	62.80	4.72
	PP	High	27	69.52	6.94
		Low	15	55.11	6.22

ANCOVA results in Table 1 clearly indicate a statistical significant difference in recall performance between the high SRL and the low SRL students who received different treatment methods (F: 37.96; p: 0.00). Thus, these findings have rejected both the first and second hypothesis. The post-hoc test was conducted to further investigate the differences (Table 3). However, the graph in Figure 5 reveals no significant interaction effect between high and low SRL students taught in the MPP and PP groups.

Table 3. Summary of Post-Hoc Test for Recall Performance between the High and Low SRL Students

in the Two Treatment Groups

Level of SRL	Groups	Mean Difference	p-value	Results
High	MPP vs PP	4.65	0.03	Sig.
Low	MPP vs PP	7.68	0.00	Sig.

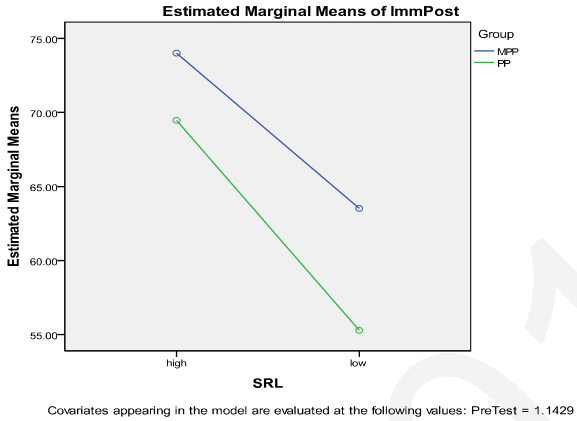

Figure 4. Interaction Effect between the Instructional Methods and SRL

Hypothesis 1: There was no significant difference in recall performance between the high students taught in the MPP and PP groups

The post-hoc test result (Table 3) indicated a significant difference in recall between the MPP and PP groups for the high SRL students, with the former performed significantly better than the latter $\left(\bar{X}_{highMPP}:74.17;\bar{X}_{highPP}:69.52;\ Mean\ diff:4.65;p:0.03\right)$. Thus, the first hypothesis was rejected.

Hypothesis 2: There was no significant difference in recall performance between the low SRL students taught in the MPP and PP groups

The post-hoc result in Table 3 revealed a significant difference in recall performance between the low SRL students in MPP group and those of the PP group $\left(Mean\ diff:7.68;p:0.00\right)$, with the MPP group performing significantly better than those of the PP group $\left(\bar{X}_{LowMPP}:62.80;\bar{X}_{LowPP}:55.11\right)$. Thus, the second hypothesis was also rejected.

Hypothesis 3: There was no interaction effect between instructional methods and self-regulated learning level

Figure 5 shows that there is no interaction effect between instructional methods and the students' SRL level on programming performance between the MPP and PP groups $\left(F:2.24;p:0.14\right)$. This would mean that regardless of SRL level, MPP method is much better than PP. Also, high SRL students outperformed the low SRL students in each method Therefore, the third hypothesis was accepted.

DISCUSSIONS

This study aims to investigate the impact of different SRL levels on the students' recall performance on the instructional methods used in learning C++ programming language. These students from the two intact groups were randomly assigned to two different instructional methods (MPP and PP). One group received the MPP treatment and the other was treated with the PP method. The research findings indicated that the difference in the recall performance for high and low SRL students between the two instructional methods were significant. However, no significant interaction effect between instructional

methods and SRL was shown. Further analysis revealed that the high SRL students in the MPP group performed significantly better than their peers in the PP group for the programming recall performance. Similarly, the low SRL students taught in the MPP group significantly outperformed those in the PP group. As such, the MPP instructional method significantly influenced on immediate recall for both high SRL and low SRL students.

The metaphors with pair programming instructional method significantly aid both high and low SRL students in visualizing the abstract concepts – either in pictorial or textual forms, thus creating higher mental models for reasoning and engaging in interactive discussion. Therefore, this finding demonstrated that metaphors facilitated and improved learning towards information recall (Flanik, 2008). The use of metaphor supported the formation of memory images of the new programming concepts being introduced and positively influenced on memory recall for both the high and low SRL students taught in the MPP group as compared to the PP group. Through classroom and practical learning, it allows the students to connect their current knowledge and experiences with novel problems and thus assists the development of a self understandable neural network in their memory. This network of information stored is easily retrieved as ideas amassed from building clearer mental schemas.

For low SRL students, effective learning takes place when they learn through positive peer pressure in a fun and joyful environment. Since these students in the MPP and PP groups had to work in pairs, they were able to discuss, find solutions for specific problems, form ideas and opinions with their partners (high SRL), and thus helped to cultivate problem solving skills, higher order thinking skills and improved their attitude towards programming (Hawi, 2010). In other words, the low SRL students participated in the discussions by explaining each other's approaches to problem solving thereby creating a higher level of conceptual understanding and promoting critical thinking skills that subsequently improved their recall performance (Flanik, 2008; Felder, 1996). Likewise, these students benefited the most from participating in heterogeneous pairs, specifically by offering further explanations to their peers. Similar results were also reported by Meseka, Nafziger and Meseka (2010) as well as Ballantine and Larres (2007).

This finding revealed no interaction effect between instructional method and the students' SRL level on programming recall performance between the MPP and PP groups. In other words, regardless of SRL level, MPP method is much better than PP. Also, high SRL students significantly outperformed the low SRL students in each method. To enforce effective learning, lecturers should consider the combination of metaphor and pair programming to be adopted in class lectures and during practical session (where the conversation of programming logic into C++ application) as well as to take note of the students' SRL levels in order to have significant influence on their programming performance.

CONCLUSION

The findings revealed that metaphor when combined with pair programming has significantly helped students' learning, both for the low and high SRL students. Thus, metaphors develop better conceptual understanding by linking the known to newly acquired abstracts; and pair programming does cultivate peer discussions. As such, lecturers should assist students to form conceptual visualisation in their working memory during their teaching in order to reinforce self learning. This study has also emphasised the importance of considering SRL components in learning the basic programming concepts through C++ language for classroom academic performance. When used effectively, these self-regulatory strategies could stimulate students' recall performance. It is suggested the lecturers should encourage their students to apply SRL in programming contexts in order to reinforce self learning. In turn, it promotes the development of knowledge and competency within self through life-long learning process.

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DOES COLLABORATION OCCUR WHEN CHILDREN ARE LEARNING WITH THE SUPPORT OF A WIKI?

Abstract: This paper reports on the outcomes of a mini-research project about visible forms of collaboration when children are learning with the support of Wikis-online editable websites. The findings were based on observing the children using the Wiki, analysis of the video recording of the task and the survey that was completed by the children using the Wiki as a tool for a task. Qualitative research methodology became a primary technique for the data collection and content analysis approach used to explore the children's behaviour when investigating the use of the wiki and video recording of the sessions. Various types of behaviour associated with collaboration, were observed when the children were working on Wiki pages with their peers.

Keywords: Wiki, collaboration, behaviour, cooperation.

Introduction

The latest innovations in technology over the last decade have had a dramatic impact on the use of technology as a learning tool in classrooms. Educational professionals have adopted the world of collaborative opportunities that the Internet has offered. Tools such as email, blogs and chat are acquainted by many teachers. Recent developments such as Wikis and RSS feeds may not be as well known, but offer wide opportunities for online collaboration for learners. They afford many unique and powerful information sharing and collaboration features. A wiki is a website where users can modify any page, by adding content or editing that which already exists.

The focus of this essay is to investigate the visible forms of collaboration when children are learning with the support of Wikis-online editable websites. A mini-research project was undertaken by a team which consisted of three researchers to find out the answers to two valuable questions;

Does collaboration occur when children are learning with the support of a wiki?

How can collaboration be interpreted in a group activity with children?

The aim of this paper is to give a critical account of the process of completing the mini-research project. After giving a brief description of what a Wiki is, the reasons for choosing the use of Wikis and its links with collaboration as a topic is discussed. Additionally, methods of data gathering, obstacles to using specific methods and any ethical issues are addressed. Finally, a sample data is presented and a relationship between the data and literature is explored to support the research findings.

Research Interest

It is very hard to give a simple definition of a Wiki, but it can be described as a combination of a web site and a word document that allows users to add, modify and update its pages. Wiki's have many different features but commonly they allow their users the ability to compare previous versions of a page, track who edited what and when. Each time someone makes a change on a Wiki page, it gets updated automatically and an older version is stored. The ease of working on a content collaboratively as a group using just a web browser can be seen as the most important element of a Wiki. The name "Wiki" was inspired by the Hawaiian word wiki or wiki-wiki, which means "quick".

Désilets and Paquet (2005) describe wikis as "simple to use Web-based collaborative hypertext authoring systems". Wiki's seen as "valuable tools for successful collaborative knowledge building" (Harrer et al 2008) and widely used by educators because of its suitibality to be used as part of computer-supported collaborative learning (CSCL) (Désilets and Paquet 2005).

Wiki's have been used for many different purposes by different groups. In education Wiki's are mainly used for group writing projects, where groups of students are responsible for creating their own content and learning from each other in the process of collaborative working. The collaborative features of wikis make them particularly well suited for cooperative learning environments (Schaffert, Bischof, et al., 2006). Wikis can also be seen as easy-to-use collaborative technologies. They can support knowledge creation and sharing (Lamb, 2004; Leuf & Cunningham, 2001; Wagner, 2004) between students.

In many ways Wikis are similar to traditional approaches of standard group work such as access restrictions, defined workflows, and structures. What makes wikis different is that user deciding for themselves how they process and groups will develop, usually by making things up as they go along. Jimmy Wales, founder of most well known example of a public Wiki 'Wikipedia' states that Wikis helps young people develop writing skills and social skills by learning about group consensus and compromise all the virtues you need to be a reasonable and productive member of society.

The research questions have arisen when we discussed the use of Wiki's in education for a group activity about how collaboration occurs and which behaviour can be identified as a sign of collaboration.

Research Approach

The aim of this research is to find out more about Wikis and their use in Primary schools. As a starting point collaboration and cooperation terms are defined in a context of teaching and learning.

The research involved different steps; finding literature, practical research in a primary classroom, analysing the data as an outcome of the practical research to find answers to focus questions. The team looked at the meaning of collaboration and cooperation in educational contexts, then, discussed how Wikis can be used to allow children to work in these forms. As a result collaboration is defined as process of participating in knowledge communities (Lipponen, 2002) and cooperation as the act of doing something together or of working together towards a shared aim. Scanlon (2000) suggests that co-operation usually means either splitting up the work or solving subtasks individually and combining the results into a final product. In adversity, collaboration can be seen as a coordinated attempt to solve a problem together.

Both these terms are explored further by Foot, H. C., Morgan, M.J. and Shute, R.H (eds) (1990) in their book Children helping Children. In this book collaboration was seen as an unstructured activity where participants don't have a specific role and don't work under the authority of an adult towards a reward. Interestingly, they control the learning and sharing process themselves and it may take place when a child turns to another to seek help. On the other hand, cooperative learning was referred to as 'highly structured where the aim of the learning and specific roles of the participants had been identified at the beginning and was controlled by the authority of an adult.

There have been various studies about the use of wikis to support collaborative learning. According to Chong et al. wikis, when supported with suitable communication tools, promote the active participation of, and higher level discussions amongst students. One of the case studies the research team looked into which had some vital links to this research question was about using 'A Wiki as a Tool for Web-based Collaborative Story Telling in Primary Schools (Désilets, A., and Paquet, S., 2005). The children were asked to design a story on paper and then write it up using Wiki. As an outcome of their study they came up with different collaboration modes for the different types of media that were being used for the task given. When the children designed their story they all worked at the same time, so the mode of collaboration was called Co-located synchronous. When they were writing their stories using a Wiki, team members worked in parallel on different parts, side by side. There were feedback, coordination and information sharing; this mode of collaboration was called Co-located semi-asynchronous. Random walk, splitting page between the team members, sharing tasks such as writing, uploading images were the visible forms of collaboration they could see. According to Désilets, A., and

Paquet, S; pair editing on story writing phase did not work well in this case. So this outcome created a question in our mind, is pair editing appropriate in primary level?

Data Collection- Ethical Issues

For the case study the team decided to have a class wiki which would be active during the current academic year. As an ICT coordinator in a primary school I took the role of creating a wiki called 'Planet 5J' for a year 5 class of children aged 9-10 years old. As I had regular access to this class, I had a discussion with the class teacher about the Wiki project. It was suggested by the class teacher that creating a 'wow' words dictionary which contained interesting and complex vocabulary would be very useful for their writing skill. This usage of 'Wow words' was also to be part of the whole schools target.

A team meeting was held to talk about how to introduce the Wiki to the children, monitoring the usage of the wiki, sampling data and gaining permission for using the data as part of our case study. It was agreed to introduce the Wiki as part of an ICT lesson, so that the children could have time to practice using it. After introducing the Wiki to the children, it was explained to them that their use will be monitored and analyzed by a team from the university as part of a study project and that the results of this project will be put onto the Fronter MLE ICT room to share with other teachers, parents and children. The team know that in qualitative research informed consent needs to be sought and may be withdrawn at any time, and additionally to include direct talk regarding the continued willingness to participate (Cassell, 1982). A generic permission letter was prepared by the school office regarding using children's photos, videos and work on school websites or publications. This letter also included a line in which it states that educators can study their work to improve standards in school. All of the children's parents signed these letters at the beginning of the year. The children were reminded that they could withdraw from the activity at anytime they liked. In case this happened extra adults were included who would work with these children undertaking different activities on the same topic as developing 'wow' word vocabulary. At the end of the study the students were given information about the findings of the research and the video and questionnaire results were placed in the schools managed learning area.

Due to the limited time scale involved, interviews with some of the children were not sought in this research as a data collecting method. The findings were based on observing children using the Wiki, analysis of the video recording of the task and a survey that was completed by the children on using wiki as a tool for collaboration.

Working with such a young group of children as part of this study, understanding the ethical principals for conducting a research was extremely important to the team. The team spent a considerable amount of time completing the 'Ethics Review Form' thoroughly as suggested by Bera (2004). According to Bibby (1997) it is important that researchers consider different moral arguments as part of their training and reflect on what is acceptable behaviour before beginning their research. It is extremely difficult to determine main moral principals which should guide researchers to deal with the ethical issues that can arise when attempting to interpret individual realities. Ethical codes can only operate as a guide. The best solution is for researchers to regularly reflect on their work to develop their understanding of the ethical concerns associated with their research (Burgess, 1989). During this research project the research team members had continuous dialogue among the researches regarding the ethical implications of our research project.

After introducing the 'Planet 5J' wiki to the children, they were allowed regular access to the wikispace; once a week for six weeks initially. They were also allowed to access the wikispace from home. After six weeks they were still allowed to access the wikispace, but sampling the data from the wiki itself was limited to these six weeks. The children were given tuition about how to edit pages, create links and make changes to previous work. They were not guided about how to collaborate as we wanted to observe the forms of collaboration that may occur naturally whilst they were editing the wiki.

Once the 'Planet 5J' class wiki was up and running, all the research team members were allowed to access the wiki so that they could all observe and monitor the activities that took place. The data collection was administered at two levels. Firstly the team conducted unstructured observations where each researcher read through the entries of 'Planet 5J's wiki and took notes that were vital to share with the rest of the team. Because of the version control tools of wikis, we were able to track the history of the

specific pages and entries. Having in mind the research question 'Does collaboration occur when children are learning with the support of a wiki?' the team was not very clear about the relationship between the wiki entries and our question. Articulating children's entries and actions on wiki in the context of collaborative working appeared to be chaotic. In order to tackle with this ambiguity it has been decided to derive coding from the text entries on the wiki to interpret the boundaries between children's entries and the research question.

The same approach was followed to investigate the video recording. The video recording of the wiki task completed by the children was watched many times and notes were taken by the research team to form an initial explanation of data. Then codes were collected from the video recording data to study deeper to find out more about the visual forms of collaboration the children were using when editing the wiki. In order to investigate the children's attitude to this experiment, a questionnaire was designed and made available online. After the wiki based learning, children were asked to complete the questionnaire.

Reflecting on the project so far, the team decided that although this is a small scale research project, it is important to use more than one method to gather data to support our findings. However when it comes to interpreting the data and constructing meaning, each member analyzed their own data followed by group discussion and analysis of the same data.

Methodology

Sample

A considerably larger than the average primary school in London agreed to host the study. The school serves an ethnically diverse community. 29 pupils from a Year 5 (age 9-10, 13 male and 16 female) class took part in the project.

Software

Wikispaces was chosen to use for this case study. The reasons for choosing Wikispaces are; it is easy to use, secure and free.

Implementation

The project ran for six weeks at the end of the autumn term in 2010. The students were asked to use a Wiki to create a whole class 'WOW' words dictionary. This is to help them to broaden their vocabulary so that they can write imaginative stories using complex sentences. By using 'Wiki's' for this task, they have an opportunity to engage in self-coordinated, collaborative work. The team wanted to see if and how young children would be able to use the 'Wiki' in collaboration.

This case study is based upon a survey that was completed by the children, including analysis of the use of Planet 5J's 'Wikispace' and a video recording of the children during their use of the 'Wikispace'. Through the study of the data collected, the team gained an understanding of; how the children used the Wiki tool to collaborate and the effects of gender in their Wiki activities. In this case the focus was the issue of collaboration. The video recordings of the sessions where children used the 'Wiki' to create a dictionary of "WOW" words.

In order to gain a better understanding about the forms of collaboration visible when children are using a wiki, qualitative research methodology became a primary technique for data collection. A content analysis approach was used to explore the children's behaviour when investigating the use of the wiki and video recording of the sessions. Furthermore, survey questions derived students' perceptions of using the wiki in the classroom. In addition, a comparison of the results from the three sources yielded reliable evidence of the particulars of the wiki use. By using triangulation research methodology the team aimed to produce reliable results which would then improve the validity of this research. According to Cohen, Manion et al (2007, p. 141), A triangulation in social sciences attempt to explore "the richness and complexity of human behaviour by studying it from more than one standpoint", and in the opinion of this author, "the more methods contrast with each other, the greater the researchers confidence".

According to Ole Holsti (1969) content analysis is a technique for making inferences by objectively and systematically identifying specified characteristics of messages. Weber (1990, p.9)

suggests that content analysis is a research method which uses a set of procedures to make valid inferences. Content analysis can involve any kind of analysis where communication content such as speech, written text, interviews, images etc. is categorized. By using content analysis as a method; it endorsed our team to observe and analyze the whole content of the 'Planet 5J'. It also allowed us to sequence the communication took place and therefore made the unobserved content of wiki data clearer. Because of the changing status of the wiki, data analysis was carried out as an iterative process where data was continuously collected and new conclusions drawn (Miles & Huberman, 1994).

The team found it very difficult to obtain coding from the theories and case studies that looked at prior to this research. Coding was mainly acquired from the conventional content analysis of the wiki entries and study of the video recordings of children working on the task. Basically the team adopted a traditional approach to analyze the findings from the video recordings drawing on Strauss's (1987) "coding from the data" method where data were analyzed as they were collected. As the team continued to analyse the data, any word, text or behaviour that represents collaboration was identified and written down. When we looked at the video we identified some behaviour that can be seen as collaboration such as; pointing at the screen, talking, critiquing, advising and suggesting. As mentioned above the team found it hard to create a code table, so we decided to have a list of mode of collaboration that was evident from the data derived through the analysis of video recording, wiki pages and survey. The research team also compared the modes of collaboration that we found with Désilets, A., and Paquet,' findings from their study. The modes of collaboration found will be discussed on the finding section of this essay.

Findings-connection with Literature and Research background

Due to the limits of space in this essay data analysis of the video recording and the children's wiki entries will be used to explain the collaboration modes that occur when children are learning with the support of wikis.

The team studied two main scenarios to identify the visual forms of collaboration in this video.

Scenario 1

Boy A made a suggestion to Boy B who was sitting next to him. Boy A did not touch the mouse or lean over Boy B. Boy A kept his distance from Boy B. Boy A pointed at the word on the screen and told Boy B what he thinks the meaning of the word is. Boy B looked at boy A's face and asked him to explain what he meant. They had eye contact during their conversation. Boy B controlled the mouse until the end of the session.

Boy A and boy B each had a PC to work on Planet 5J's 'Wikispace'. Boy A did not use his PC; he moved his chair next to Boy B and worked with him on Boy B's PC.

Scenario 2

During 'Wikispace' work in the ICT suite Girl D saw that Girl E had spelt the word incorrectly. Girl D left her chair and came over to speak to Girl E. Girl D stood behind girl E. She moved her hand over Girl E and pointed on the computer screen to the word that she had written. She then took control of the mouse and corrected Girl E's mistake. After this she explained to her what she needed to do. Girl D returned to her seat. Girl E subsequently turned to another girl F who was sitting next to her and took the control of her mouse and showed her what to do.

Content analysis of the video has shown that the children worked collaboratively in many ways while they were working on the Wiki task. Jonassen et al states that 'mind tools' helped users express what they know and construct knowledge through critical thinking and higher order learning. In our video recording we could see that using Wikis as a mind tool motivated students to learn, and having a shared learning space improved collaboration between learners. The children were actively involved in designing their own knowledge and helping their peers to learn. While they were typing their wow words onto the wiki, when they saw some entries that were not describing the word correctly or when they found the description not detailed enough, they stood up and lead discussion on how to improve it. This helped them to construct a new knowledge through collaborative working. These student centred collaborative

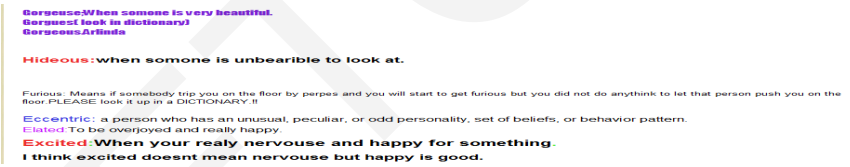
learning activities enabled the learners to take control and responsibility of gaining new knowledge (Myers, 1991).

Another important finding from this video was the improved communication that led to collaboration within the group. Whilst the children were editing their pages, they realized that many others were editing the same page. They could not see their entries directly. They saw this as a problem as they wanted to see their entries directly. Some of the children suggested that either they should ask if someone else was editing the same page and waited until they had finished or go and sit next to that person and work together. Instead of sitting and waiting for a solution or asking the teacher for help they decided to communicate directly with their peers in order to resolve the issue. In other words using wikis improved communication between learners; they can be characterized as enablers of socio-constructivist learning (Schneider et al., 2002). There was also many scenes where they were modifying entries, asking for help from others with explaining their words, suggesting, discussing, questioning and analysing not only their peers but also their own entries. The evident of this can be seen on the wiki pages. Figure 1 shows that a child spelt the word 'Amazing' wrong. Another child made a suggestion for correcting spelling underneath it. We can also see similar action when a child tried to describe the word 'disgusting', where description of the word was re-written by another child.

Figure 1:

Again figure 2 shows children suggesting the correct spelling of the word or asking their friends to use a dictionary if necessary. We can also see that a child describing the word 'excited' and another child giving their own opinion of the meaning of the word.

Figure 2:



According to Lipponen (2002), computer supported collaborative learning such as Wikis promotes peer interaction and allows the sharing of knowledge within a group of learners. In scenario 1 above boy A asked boy B for his opinion about the meaning of a word; in scenario 2 girl D correcting girl E's mistake, girl E passing on her new knowledge to girl F. After analysing these scenarios closer the team found that children are not just learning to write collaboratively; they are also developing many collaborative skills, negotiating with others to agree on correctness, meaning relevance and more(Fuchs-Kittowsk & Köhler, 2005; Godwin-Jones, 2003; Wang& Turner, 2004).

As explained in the previous section of this essay we came up with a list of modes of collaboration linked to the special areas it occurred.

Content-related: Where children helped each other to write and explain the meaning of the 'wow' words; one child suggesting another one which word can be classified as a 'wow' word.

Technology-related: Children explaining each other how to use the functions of wiki software.

Random help skills: Where children showing interest and willingness to help their peers sitting next to them or leaving their chair to go and help others when they needed help.

Comparing the research findings with Désilets and Paquet's research

According to Désilets and Paquet's study (2005) collaboration had two modes; co-located synchronous and co-located semi synchronous. In the Co-located synchronous mode of collaboration; children were observed working side by side on the same task which was designing a story. The activity was paper based. In the co-located semi synchronous mode of collaboration, children were noticed working on parallel tasks, sitting side by side. They were working in a coordinated way and were sharing information. They were also giving feedback. The team hasn't used a paper based activity, nevertheless observed children using similar co-located synchronous and co-located semi-synchronous strategies. In some instances children were working independently on different parts of the "WOW" words dictionary, either in parallel or at different times and in some instances they were working on the same page. Désilets and Paquet (2005) stated that pair-editing mode of collaboration did not happen during their study. In this case study the use of a pair-editing strategy was detected where one child was the driver who typed the words and other was the navigator who helped driver.

The mini-research project produced some important results regarding the modes of collaboration drawn from the wiki based learning experiment. From the analysis of the data we saw children working collaboratively in many ways. They observed their friends' mistakes on Wikispaces, and then they left their chair and went to speak to the person who had made the mistake. The children worked in pairs, randomly walked around and helped their peers. They made suggestions and criticized others work by pointing at the computer screen or taking control of the mouse and keyboard to model what they thought was the correct answer. The use of a video as a data gathering method was extremely useful as all the members of the research team had an opportunity to see the children working on the task. Although the video recording gave some important data for this research, the team also had difficulties analyzing it fully as it was sometimes very difficult to see exactly what the children were doing when they were editing the wiki pages. Were they modifying, deleting, or suggesting?

Because of the noise level in the classroom, it wasn't always easy to hear their dialogue with their peers. When it comes to using the data analysis of the wiki entries itself, although we can see some changes and suggestions made by the children, the volume of this data is not very high. Giving the children more time to work on the wiki pages or using the wiki with more classes may have given us more information about the relationship between wikis and collaboration. Also having a clear idea about the coding of collaborative behaviour would also help with conceptualize the data from the video and the wiki pages.

Conclusion

The purpose of this study was to investigate the visible modes of collaboration when children are using a wiki as a learning tool. Based upon research findings it can be suggested that children are collaborative when learning with the support of wikis. Therefore, wikis could be seen as an effective tool to support collaborative learning and knowledge sharing in education and facilitates group learning where students can learn and share knowledge. Various type of behaviour associated with collaboration, were observed when the children were helping each other with their tasks.

This case study has shown that using a wiki brought the group members together to edit the Planet 5J wiki pages which allowed children with similar ideas to collaboratively build on each other's work. It also gave the children equal access to the most recent version of the wiki.

This research project gave the team an understanding of how collaboration emerged when the children were using wiki as a learning tool. It also gave an insight of how knowledge was built socially. For the future research, it will be worth to try providing children with more structured tasks, where children have an opportunity to work as a team and are given a longer time to complete the task. The children could also be given information about types of roles they could foster in group work. This may help them with understanding of how a group functions when they are working together.

The data collection methods used for this mini-project were appropriate for showing the modes of collaboration that occurred however, the scale of the research was not large enough to draw general

conclusions. Further research is recommended to confirm the findings of this research, and decide the magnitude to which modes of collaboration can be associated with wikis.

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DOES LANGUAGE PROFICIENCY MATTER IN REDUNDANCY PRINCIPLE?

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ABSTRACT
Although much about redundancy principle per se has already been investigated to date, notably by the studies conducted with native speakers of English, so much more, specifically the impact of language proficiency on redundancy effect, lies undiscovered. The present study revisited the redundancy principle in an EFL setting and explored the impact of language proficiency on redundancy effect. The main results showed that advanced students outperformed intermediate students in animation with narration (AN) retention tests. As for the transfer tests, although advanced students did better than intermediate students on simultaneous animated narration with on-screen text (ANT), *t*-tests revealed that they did not significantly differ from each other. Persona evaluation checklist and interviews showed all the participants enjoyed and concurred with the animation with sequential narration and on-screen text (A-NT) presentations. Some implications for teachers and material developers are also suggested.
Keywords: Educational technology, multimedia learning, redundancy principle, language proficiency

INTRODUCTION

Research studies have investigated the impact of multimedia on students' retention and learning over the past two decades, thereby having allowed us to gain considerably deeper insights and to construct tenable theories underpinning multimedia as a propitious tool. More specifically speaking, cognitive load theory (Paas, Renkl, & Sweller, 2003; Sweller, 1999; Sweller, van Merrienboer, & Paas, 1998) and cognitive theory of multimedia learning (Mayer, 2001, 2005) are the two most conspicuous theories underlying multimedia learning. These theories elucidate separate cognitive processing intended for learning and mental representations in working memory.

The fundamental precept of cognitive theory of multimedia learning is based on three assumptions, each of which has distinct processing mechanisms necessary for verbal and visual representation: (a) dual-channel assumption argues that both visual and verbal channels process information separately (Clark & Paivio, 1991; Paivio, 1986); (b) limited capacity assumption claims that both information processing channels have limited amount of capacity at one time (Baddeley, 1992; Chandler & Sweller, 1991); (c) generative learning assumption suggests that human beings generate knowledge by making sense of the information obtained through both channels. To wit, what is essential for meaningful learning is not only the selection of words and images, and organization them in tandem but also the integration of relevant elements with prior knowledge. Otherwise, mental amalgamation should cause mental overload in learners' cognitive system, thus challenging meaningful learning to spawn.

As for the cognitive load theory, it suggests that there are three separate but additive sources of cognitive load in learning. Germane load is central processing, leading learners to construct knowledge by selecting words, selecting images, organizing words, organizing images, and integrating in tandem (Mayer & Moreno, 2003). Incidental processing or extraneous load is unnecessary or redundant cognitive process such as background music; therefore it does not require learners to make sense of the elements in the presented material. Intrinsic load or 'representational holding' (Mayer & Moreno, 2003) is to do with retention of cognitive representations in working memory over a certain period of time.

Diao & Sweller (2007) claim that to circumvent cognitive load within working memory, while extraneous load should be minimized, on the one hand, germane load should be increased, on the other. If extraneous processing engenders cognitive overload during selection, organization, and integration process, this type of redundant or unnecessary source of information should be weeded both to 'make narrated animation more concise and coherent' (Mayer & Moreno, 2003, p.48), 'to free working memory capacity' (Diao & Sweller, 2007, p.80) and to germinate meaningful learning. Kalyuga, Chandler and Sweller (1998, 1999) researched and found out that not integration but elimination of redundant materials results in better

performance and that weeding redundancy leads to more meaningful learning than the inclusion of redundant material. So, redundancy effect was found.

Although much about redundancy principle per se has already been investigated to date, notably by the studies conducted with native speakers of English, so much more, specifically the impact of language proficiency on redundancy effect, lies undiscovered. Few studies, to the knowledge of the researcher, have investigated redundancy principle in EFL contexts and the effect of language proficiency of EFL learners. The research review in the following section delves into the studies which looked for the extent to which redundancy effect impedes or facilitates mostly ESL students' reading comprehension and recall.

PRIOR STUDIES

Illustrated materials with graphics, sound, video and animation are of central importance for rendering information in multimedia learning. When incidental processing increases and when humans have difficulty sharing their attention between the same sources of visual information in the visual memory channel, it leads information to be unintelligible (Jamet & Bohec, 2007), overloads heavily one channel at a time and finally causes split attention. Whereas some early studies found out that redundancy effect has such deleterious effect on learning (Kalyuga et al., 1998, 1999; Mayer, Heiser & Lonn, 2001; Diao & Sweller, 2007), others found out under some conditions that redundancy effect either fosters meaningful learning or if not, at least it does not cause hurdle on working memory (Moreno & Mayer, 2002; Experiment 1 and 3; Mayer & Johnson, 2008).

Several studies revealed that split attention effect was detrimental to learning. Kalyuga et al. (1998) exposed students to diagrams with speech, with printed text, and with both printed text and speech (redundant group). The analysis displayed that learners receiving diagrams accompanying with narration or speech outperformed learners exposed to diagrams with both speech and text. This result can only be ascribed to the fact that visual channel is overloaded when learners both read printed text and follow diagrams. So, redundancy effect was confirmed.

Aiming to further the investigation of redundancy effect in multimedia environment along with animations rather than diagrams, Mayer, Heiser and Lonn (2001) compared students receiving animated narration with students receiving animated narration accompanying with on-screen text summaries (Experiment 1). The results demonstrated that on-screen text summary group remembered less in retention and produced fewer creative solutions in transfer tests. In the second experiment, Mayer et al. evaluated the extent to which full text and summary text differ and found out that the full text and summary text group did not differ from one another and that animated narration group outperformed students in the groups receiving full text and summary text along with narrated animation.

Diao and Sweller (2007) compared two groups: reading-plus-listening group and reading only group. To cognitive theory of multimedia learning, giving identically analogous information as in the reading verbatim listening group (verbal redundancy) hinders meaningful learning. The results showed that both reading and listening simultaneously engendered higher mental load and thus led to inferior general understanding and remembering. However, if Diao and Sweller had provided the participants to read first, and to listen later just as Gorsuch and Taguchi (2010) did, students would not have had higher mental load that would preclude them to recall and to learn better. In their study, Gorsuch and Taguchi controlled redundancy effect and the results revealed that both reading and listening at the same time helped students improve their reading comprehension.

So tides turned when some research studies looked into conditions in which redundancy could aid to comprehension. These studies manipulated redundancy in spoken and written modes; compared simultaneous and successive presented materials besides redundant and non-redundant formats. They found out that when the elements in the presented material are simultaneous, redundancy induces negative effect; when the presentation is successive, positive effect. In Moreno and Mayer's study (2002, Experiment 1 and 3), the presentation of concurrent narration (spoken) and on-screen text (i.e., verbal redundancy) helped students more than that of narration only. In Experiment 2, students receiving redundant materials sequentially were superior to those who learned with nonredundant verbal materials simultaneously. This positive redundancy can be attributed only to the fact that sequential presented

material does not cause split attention, and so it does not cause hurdle on working memory. Only by preceding the elements in the presented materials can split attention effect be surmounted.

Manipulating on-screen text in a way that does not require learners to read all sentences, and so aiming to revise redundancy principle, Mayer and Johnson (2008) gauged learners' retention and learning on redundant and nonredundant versions. In redundant format, students received animated narration with action-oriented key words from the narration; whereas, in the nonredundant format, students were confronted only with animated narration. The redundant group recalling short key words easily performed better but only in retention test, not in transfer test.

To sum up, all these studies have sought to address the insights underlying redundancy principle and investigated new ways of presenting materials to students in a way that does not cause overload on working memory. Yet, most of these studies have revealed insufficient results about redundancy principle, notably about the impact of language proficiency on redundancy effect. Thus, the present study aims to investigate redundancy effect from this angle. More specifically, the research questions are:

a. In which presentation do intermediate and advanced level students differ when they are engaged in animation with sequential narration and on-screen text (A-NT); animated narration (AN); simultaneous animated narration with on-screen text (ANT)?
b. Does language proficiency of EFL learners have an impact on redundant (ANT)/nonredundant (AN) presentations?
c. What are the preferences of EFL learners with regard to the effectiveness of presented materials within the framework of multimedia learning?

Hypotheses

It was hypothesized that learners would remember many more idea units and produce more creative solutions in successive A-NT material than in AN and ANT material, respectively (Moreno & Mayer, 2002, Experiment 2). Sequential presentation should facilitate mental processes and representations in working memory, thereby leading to more meaningful learning than the other versions (Hypothesis 1).

As for the impact of language proficiency on redundancy effect, it was predicted that advanced EFL students would outperform intermediate students in the redundant (ANT) and nonredundant presentation (AN). To Clarke's short-circuit hypothesis (1988), lower proficiency learners should have limited language proficiency 'exerting a powerful effect on the behaviors utilized by the readers' (p.119) and intermediate learners' limited control over the language should preclude them to integrate and to process information interactively in their cognitive system (Hypothesis 2).

With respect to the preferences, learners at both levels should have more positive tendency in animation with successive narration and on-screen text (A-NT) (Hypothesis 3). Since students have more processing time to deem about the content of the presented material and since they view the animation longer, they should prefer this version more than the other two.

METHODOLOGY

Participants

The participants were 60 first year undergraduate students recruited from a university in Turkey. The mean age was 20.92 years (SD=1.062). Thirty participants in the intermediate group (59% females, 41% males) and thirty in the advanced (34% females, 66% males) served for the study. All had almost six years of English study at high school prior to tertiary level. Students were placed in their proficiency levels on the basis of their TOEFL exam, which was performed by the university. The participants getting over 80 were accepted as advanced; between 40 and 60, intermediate.

Materials and Design

The computer-presented materials consisted of animation with narration (AN), simultaneous animated narration with on-screen text (ANT), and successive animated narration with on-screen text (A-NT). AN was about how water cycles; ANT was about how earthquakes happen; A-NT was to do with the process of photosynthesis. Both intermediate and advanced students received the same presentations. These

materials consisted of three Powerpoint slides. They included static but successive/simultaneous illustrations. The slides advanced automatically. AN included a 44-s presentation and 7 slides depicting how water cycles; ANT included a 117-s presentation and 10 slides showing how earthquakes happen; A-NT included a 160-s presentation and 9 slides about the photosynthesis process. On screen text was written fully under each slide in ANT and A-NT presentations. The students could not replay the slides and they were required to complete all the tests respectively.

The paper-based materials for each student consisted of a participant questionnaire, a prior knowledge test, a retention test question and seven transfer test questions for each of the A-NT, AN and ANT presentations; a persona evaluation checklist. The participant questionnaire solicited information about their age, gender, and TOEFL exam score. It was given along with the prior knowledge test which consisted of a five-point Likert scale (1= very little; 5= very much) in which students' levels of knowledge about water cycle, earthquakes and photosynthesis were assessed. The retention test question asked the participants to write whatever they recall about the topics; for example, "how does water cycle happen?" The transfer test required learners to utilize and transfer the knowledge that they obtained through the presentations into other situations; for example, "why is chemical energy necessary during photosynthesis?" The persona evaluation checklist in the study of Craig, Gholson, & Driscoll (2002) was used to elicit participants' opinions about the presentations; it consisted of a Likert-type scale, ranging from 1 to 6 (1=extremely enjoyable; 6=extremely nonenjoyable) (see table 1 and table 2).

Procedure

This study was conducted with first year undergraduates at a university in Turkey in the first semester of 2010-11 academic years. All the students were invited to a conference hall to be informed about the research and its aim. When the participants came, they were handed out a packet of materials, consisting of a participant questionnaire; an informed consent letter, and a prior knowledge test. After students' knowledge levels were ascertained, ten students were excluded because of their high scores on the prior knowledge test. 60 students left for the study. Prior to study, they watched an example slide about a different topic and then they completed retention and transfer test questions about it. So, all students were familiar with what they would perform later.

Afterwards, students came to the computer laboratory in groups of 10 per session. The apparatus consisted of 6 Pentium III PC computer systems, with a 14-inch monitor. Two tests were conducted after each of the presentation was over. The first test was a free recall task in which the participants were asked to write down in English whatever they remember about the presentation they watched. They were given 5-min time limit to answer the retention question. The second was transfer test in which students were expected to answer a set of questions by using the knowledge that they gained from the presentations. Each transfer test lasted for 10 minutes. Upon completion of all the presentations and tests, students were given a persona evaluation checklist to learn their opinions about which model they enjoyed and thus preferred much. After they were thanked and debriefed, randomly selected 6 students from intermediate and 6 from advanced group were invited to focus group interviews in their L1.

Scoring and Analysis

The prior knowledge level of the participants about the topics was evaluated by excluding students who scored over 3 out of 5 in the Likert scale. The persona evaluation checklist was assessed by looking into the percentages of the participants' opinions. With respect to the retention test, first, 6 key idea units for each topic (water cycle, earthquakes, photosynthesis) were determined together with an expert on these topics. Second, 1 point was given for each idea unit and computed without regarding wording or grammar. In transfer test, there were 7 items for each presentation and 1 point was given for each item; they were computed by counting the total number of the correct responses without regarding wording and grammar. For interrater reliability, the same expert scored each of the idea units in retention tests and each of the items in transfer tests. The reliability was .96. Both types of tests were analyzed through independent sample *t*-tests. Patterns in the focus group interviews about the three different presentation models were also coded.

RESULTS

In which presentation do intermediate and advanced level students differ when they are engaged in animation with sequential narration and on-screen text (A-NT); animated narration (AN); simultaneous animated narration with on-screen text (ANT)?
When the mean scores of intermediate and advanced groups were compared between A-NT, AN, and ANT retention tests, advanced students remembered more idea units in three of the three tests (M=5.1, 4.9, and 4.1, SD=1.92, 1.86, 1.56) than did intermediate students (M=4.8, 4.0, and 3.8, SD= 1.86, 1.65, 1.70) for A-NT, AN, and ANT retention tests, respectively. As for the transfer tests, intermediate students produced fewer creative solutions (M=5.2, 4.8, and 4.0, SD= 2.10, 1.82, 1.78) than did advanced students (M=5.3, 4.6, and 4.5, SD= 2.38, 1.94, 1.68) for A-NT, AN, and ANT transfer tests, respectively.

Does language proficiency of EFL learners have an impact on redundant (ANT)/nonredundant (AN) presentations?
Independent sample *t*-tests revealed that there was only significant difference between advanced (M=4.9, SD= 1.86) and intermediate students (M=4.0, SD=1.65) in AN retention tests, $t(60)=1.\ 64$, p=0.015, d=0.60. With respect to the transfer tests, independent sample *t*-tests showed that there was no significant difference between intermediate (M=4.0, SD=1.78) and advanced students (M=4.5, SD=1.68) in ANT transfer tests, t(60)=1.22, p=0.06, d=0.48.

What are the preferences of EFL learners with regard to the effectiveness of presented materials within the framework of multimedia learning?
To cross-analyze the quantitative findings, qualitative data were collected through a persona evaluation checklist and focus group interviews. In the persona evaluation, the participants were asked to rate the extent to which A-NT, AN, and ANT presentations were enjoyable for them to recall more and to learn better .

Table 1. Intermediate students' opinions about how much enjoyable the presentations were.

Intermediate	Extremely enjoyable (%)	Enjoyable (%)	Somewhat enjoyable (%)	Somewhat nonenjoyable (%)	Nonenjoyable (%)	Extremely nonenjoyable (%)
A-NT	51	38	11	0	0	0
AN	0	15	13	24	30	18
ANT	0	8	11	15	37	29

Table 2. Advanced students' opinions about how much enjoyable the presentations were.

Advanced	Extremely enjoyable (%)	Enjoyable (%)	Somewhat enjoyable (%)	Somewhat nonenjoyable (%)	Nonenjoyable (%)	Extremely nonenjoyable (%)
A-NT	38	43	19	0	0	0
AN	25	17	21	17	16	4
ANT	0	12	16	27	23	22

In the persona evaluation, the most salient consensus among the intermediate and advanced students was for the sequential A-NT presentation. All the participants revealed that sequential presentation was more enjoyable, useful and thus easy to recall more and to learn better. In addition to this, for A-NT presentation, one of the intermediate students interviewed stated that
'Although it was difficult for me to answer transfer questions and write whatever I recall for A-NT presentation, it was easy for me to draw what I saw. I could draw what I saw in the A-NT presentation.'

In the interview, another participant in advanced group provided a similar response:
'Because A-NT presentation was successive, I had time to think and predict what the ensuing narration and text were about. When the narration, animation and text were shown sequentially, I was confirming my prediction, thus understanding and recalling more. I could also draw what I remembered on the sequential A-NT retention test'
What is more interesting for A-NT presentation is that one intermediate student stated that

'When I first saw animation with sequential narration and text, it helped me to recognize the word aurally, visually and in written form. This situation helps me to integrate the picture and the word interactively'.
Another advanced student confirmed the intermediate student:
By analyzing pictures first and texts later, I was able to recall more because I united key words and pictures in the A-NT presentation. This also provided me to learn vocabulary both visually and in written form, because I could understand whether it was a verb or noun in the text.

As for the AN presentation, while 42 % of the advanced students rated it was 'extremely enjoyable' and 'enjoyable', 15% of the intermediate students rated it was only 'enjoyable'. In the interviews, the participants in the advanced group stated that they could understand what the topic was about without the on-screen text; however, those in the intermediate group stated that they needed on-screen text. With regard to the ANT presentation, most of the participants at both levels rated it was not enjoyable much. During the interviews, they expressed that ANT presentation was difficult for them to follow and understand narration, text and animation at one time. One intermediate student stated that 'although narration did not interfere my understanding, the presence of text and animation simultaneously did.'

DISCUSSION

The first hypothesis that the participants would differ and recall many more idea units on retention tests and produce more creative solutions on transfer tests for A-NT presentation than for AN, and ANT presentations was confirmed. Generally speaking, mean scores revealed that both advanced and intermediate students were more successful in A-NT than in AN and ANT retention and transfer tests. This is attested to the fact that the deleterious effect of split attention is minimized when redundant on-screen text is preceded by the corresponding animation. Furthermore, through sequential presentation, redundancy effect which is detrimental to learning turns into positive effect, from which students benefit. This result is also consistent with that of Moreno and Mayer's study (2002, Experiment 2) in which they found out that the redundant group outperformed the nonredundant group when the presentations were sequential.

The second hypothesis that advanced EFL students would outperform intermediate students in the nonredundant presentation (AN) was confirmed only on retention tests. Independent sample *t*-tests showed that advanced students (M=4.9, SD= 1.86) differed from intermediate students (M=4.0, SD=1.65) only in AN retention tests, $t(60)=1.64$, p=0.015, d=0.60. This can be attested to Clarke's short-circuit hypothesis (1988) contending that limited proficiency exerts significant effect on the lower proficient learners' behaviors which revert them to poor reading strategies. In this study, lower proficiency was found to hinder students to select words and images, organize and integrate them in tandem in multimedia learning. On the other hand, the second hypothesis that advanced EFL students would outperform intermediate students in the redundant presentation (ANT) was not confirmed. Although intermediate students (M=4.0, SD=1.78) seemed to have created fewer solutions in the redundant ANT transfer tests than advanced students (M=4.5, SD=1.68), *t*-tests showed that the superiority of advanced students was not significant $t(60)=1.22$, p=0.06, d=0.48. In fact, this study revealed that the participants at both levels did not differ.

Qualitative results obtained through persona evaluation checklist and focus group interviews pinpointed to the effectiveness of the sequential A-NT presentation. So, third hypothesis was confirmed. The checklist showed that 89% of the intermediate students and 81% of the advanced students found A-NT presentation 'extremely enjoyable' and 'enjoyable' (see table 1 and table 2). In the interviews, almost all the participants expressed that sequential presentation provided them time to think and produce hypotheses about the ensuing text. A-NT presentation helped them visualize pictures and texts so much so that they could draw whatever they watched. This sequential presentation provided ample time, through which the participants saw pictures and words together. So they learned vocabulary visually. To sum up, the participants' quantitative responses on both retention and transfer tests were consistent with those on evaluation checklist and interviews.

IMPLICATIONS & CONCLUSION

The results have some important pedagogical implications for specifically EFL teachers. Advanced students outperformed intermediate students both on retention and transfer tests and advanced group did significantly better than intermediate group in AN retention test. Yet almost all the participants at both levels enjoyed and preferred sequential presentation much more than the other formats. Both intermediate and advanced students stated sequentially presented material would help them to learn more.

In addition to learning from the A-NT format – however redundant it is – it can also foster 'the learning of English when instruction is directed to learning the language itself' (Diao & Sweller, 2007, p.78). In multimedia learning, students can see animation or text first successively rather than simultaneously and then they can hear narration. If students improve both reading and listening and pronunciation as in the Gorsuch and Taguchi's study (2010) through repeated reading and listening sequentially, then, a fortiori, they can benefit from redundant materials if the presentation is directed repeatedly for the sake of learning English. Teachers and material developers can prepare advanced students nonredundant materials (AN) as well as redundant but sequentially presented materials (A-NT). Advanced students in this study were more successful in AN retention test and 42% of them stated 'extremely enjoyable' and 'enjoyable' for AN presentation in the evaluation checklist. As for the simultaneous redundant presentations (ANT), not only 72% of advanced but also 81% of intermediate students found ANT presentations no enjoyable. So teachers may not give priority to ANT materials in classes.

This research study revisited redundancy principle and looked into whether language proficiency matters in redundancy principle of multimedia learning. Further, because the study looked for the effect of language proficiency on redundancy, it sheds light on the redundancy effect from another angle and presents some central pedagogical implications for both teachers and material developers to take into consideration.

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DOES SCREENCAST NEEDS NARRATIVE SUPPORT FOR EFFECTIVE LEARNING?

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ABSTRACT

The aim of this study was to investigate the effects of screencast with narration and without narration in enhancing learning performance. A series of screencast teaching Flash animation software was developed using screen capture software for the purpuse of this research. The study was conducted under the online self-paced learning condition. A pre-test post-test experimental design was used involving two different groups that studied the two different strategies. The results indicate that screencast with narration was significantly more effective than screencast without narration in enhancing students' learning performance.

Keywords

Digital video, learning, narration, screencast, screen capture, video sharing

Introduction

The educational value of videos lies in its dynamic visual representation that can be used effectively to show screencast, places, implied processes, storytelling and many more benefits. They can be played silently or applied in combination with audio tracks. When used in a correct manner and combination, video's role as dynamic visual representation might be a powerful tool in enhancing teaching and learning (Montazemi, 2006).

In developing digital video content for learning, teachers need to take into consideration the role and limitations of students' cognitive ability. They need to understand how videos can be used to foster learning, and they should design and develop the materials not from the teacher's perspective, which may risk losing learners' attention and engagement. Therefore, an understanding on how video presentation affects students' learning requires a depth analysis of how it is processed in the human memory structure.

Learning is a process of receiving, processing, coding, storing and retrieving information from memory structure (Lin & Dwyer, 2004). Human memory structure is divided into three processing categories namely sensory memory, short-term memory and long-term memory (Atkinson & Shiffrin, 1971; Mayer, 2001). These memories are limited in terms of capacity and duration. Therefore, not all the information entered the memory structure will be registered in long-term memory structure in schema form (Chandler, 1995). Information entered into the memory structure is processed through two different channels; visual channel that processes visual information such as picture, and verbal channel that processes verbal information such as narration and text (Paivio, 1986; Mayer, 2001). Since human memory is limited in terms of duration and capacity, placing a high cognitive load on one channel may reduce the effectiveness of presentation. By presenting material in a form that involves both channel will reduce the cognitive overload in each channel and the presentation will be more effective (Mayer, 2001).

Based on this multimedia dual coding theory, video with adequate verbal support is more effective in assisting students' cognition. Notwithstanding the strong arguments and theoretical support, research findings on the effectiveness of digital video for learning remain inconsistent (DeVaney, 2009; Dupagne, Stacks & Giroux, 2006; Veronikas & Maushak, 2005). Some findings seem to suggest that video is only suitable as an additional tool to support students' understanding only on certain topics, and not across the entire curricula (DeVaney, 2009; Montazemi, 2006). Inconsistencies of the findings may be partly

attributed to improper design of the video materials and the failures of the developers to take into consideration the limitations of human cognition in their design. For the latter, arguably many developers have failed to pay greater focus on the potential cognitive overload caused by information being presented too much and too quickly, or by the simultaneous appearance of moving elements, narration and on-screen texts in their design that may impede learning (Bell & Bull, 2010; Mayer, 2002).

Furthermore, a pertinent question arises on the need of verbal support such as narration to be employed in the video development and implementation. Even though the dual coding theory proposes that the inclusion of verbal element to support visual element is helpful in terms of reducing cognitive overload, the additional narration does not always support learning (Jeung, Chandler & Sweller, 1997; Fenrich, 1997). With short and simple video and utilization of user-control and rehearsal functions, the video might promote successful learning even without verbal support. Therefore, the primary objective of this study was to investigate the effectiveness of instructional video with narration and without narration in promoting and enhancing learning.

Method

Research question

Based on the discussion above, the primary research question of this study is as follows:

Is there a significant difference between screencast with narration and screencast without narration teaching impacts on students' online learning achievements?

Learning Materials

Two groups of videos consisting of six screencast series were created with Camtasia Studio screen capture software for the research. The screencast series were used for teaching Flash animation software functions namely setting the screen properties, introduction to timeline, drawing tools, creating keyframe and frame, creating motion and saving the output. The first group comprised a screencast series without narration and the second group was based on the same screencast series, but included with narration. The screencast series duration ranged from one to two seconds.

The screencast series developed was uploaded to two separate channels namely MOVIEDU1 and MOVIEDU2 created in YouTube. Two new channels were created to avoid any distraction from any unrelated videos throughout the study that may influence the learning outcome. The first channel contains screencast series without narration and the second channel contains screencast series with narration.

Test Instruments

Pre-test and post-test were used on the two groups that studied the two different screencast presentation strategies respectively. Pre-test and post-test were hands on test that required students to create an animation of bouncing ball by following the specific properties requested. Grades were given based on how accurate students employ the required properties in their design. The pre-test was conducted before the learning process and the post-test was conducted immediately after the learning process.

Procedures

The research sample comprised 45 undergraduates drawn from two intact classes, whose ages ranged from 21 to 25 years and whom were enrolled in a Diploma in Education course. The study was conducted separately for both groups. Pre-test to identify students' prior knowledge consistency of the content was conducted before the study. Fifteen minutes were given to them to complete the task. Immediately after the pre-test, the two groups explored the two different screencast presentation methods that were with and without narration. They were first briefed on how to access and use the materials in the respective channels. Students were also encouraged to utilize the user-control elements in the video player throughout the study. Approximately, 30 minutes were allocated for them to complete the study. Four research assistants helped the researchers monitor the students to ensure that the latter comply with the procedures of the study. Upon the completion of the tasks, a post-test was conducted that lasted for

fifteen minutes. One-way ANOVA test was used to analyze the data collected from the pre-test and post-test.

Results

Consistency of prior knowledge was determined through the pre-test results. From the one-way ANOVA test, Levene's test for homogeneity of variances is not significant ($p>0.05$) and therefore the population variances for each group are approximately equal. The output shows that there is no significant difference in the pre-test achievement of students in screencast without narration and with narration strategies $F(1,43)=0.15$, $p>0.05$. This result further assured that there is no pre-existing difference in prior knowledge by group. Total mean scores of prior knowledge are also obviously low ($M=7.22$, $SD=8.57$), which is necessary for the study.

Students' achievement was determined through the post-test results. From the one-way ANOVA test, Levene's test for homogeneity of variances is not significant ($p>0.05$) and therefore the population variances for each group are approximately equal. The output shows that there is significant difference in the post-test achievement of students in screencast without narration and with narration strategies $F(1,43)=16.62$, $p<0.05$.

Mean scores indicated that students in the screencast with narration strategy ($n=22$, $M=76.14$, $SD=16.25$) obtained a better mean score than those students in the screencast without narrataion strategy ($n=23$, $M=52.09$, $SD=22.65$). The results indicated that screencast with narration was better than screencast without narration in enhancing learning.

Discussion

With the emergence of online video sharing technology, learners can have the opportunity to learn in conducive learning environments that are both visually appealing and cognitively compelling. When used appropriately and judiciously, video being a dynamic visual representation plays a potential role in assisting learning. However, it appears that research findings with regard to the effectiveness of digital video on learning have been inconsistent (DeVaney, 2009; Dupagne, Stacks & Giroux, 2006; Veronikas & Maushak, 2005). The main reason of these inconsistencies may be attributed to the design limitations particularly due to some of the developers' poor grasp on the theoretical underpinnings that may impact learners' cognition (Bell & Bull, 2010; Mayer, 2002). Keeping the video short and simple, and encouraging learners to fully utilize the control functions in the digital video player can have a positive impact; learners' cognitive overload is minimized throughout the learning process, which improves learning. However, question arises on the need of verbal element to support the visual display if the video employs these development and implementation principles. Thus, this study has investigated the effectiveness of digital video, specifically instructional screencast teaching software with and without narration on students' achievement. The findings show that students in the instructional screencast with narration strategy obtained better mean scores than students in the instructional screencast without narration strategy. This suggests that narration supported in the instructional screencast had been very helpful for successful learning, especially for learners with low prior knowledge in this study, which concurs with Mayer's (2001) dual-coding assumption. Screencast with narration that utilize both visual and verbal channel in the memory structure can attenuate cognitive overload resulting in effective learning as pointed out by Mayer (2001). Since this study only focused on narration as a verbal element, further study is warranted to investigate the effectiveness of text as verbal element on learning as informed by the dual-coding assumption, specifically in the instructional screencast design.

Acknowledgement

The authors wish to acknowledge the support of the Research and Management Centre, Universiti Pendidikan Sultan Idris, who awarded a research grant for this study.

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DYNAMIC ANGLES WITH GEOGEBRA

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ABSTRACT

In this paper in a dynamic way we present the processing of angles on a transversal, angles with perpendicular rays and angles with parallel rays. These angles seem rather trivial, but are used in complex geometry situations to help solve problems. Because students very rarely perceive the application of these angles, we hope to resolve problems that may arise by using the angles in geometric problems.
The main purpose of this paper is to compose several dynamic applets with the help of freeware dynamic mathematics software GeoGebra, and to place them on the PBworks service.
This way we get dynamic worksheets, where students can move the pair of angles and test if the angles are equal or supplementary. This gives a clear image which pair of angles are corresponding, alternate, consecutive, which angles have parallel rays, which angles have perpendicular rays and which ones are equal or supplementary.
Keywords: angles, geometry, GeoGebra, construction, transversal, PBworks

INTRODUCTION

Geometry as a mathematical discipline is difficult to understand for many students, especially for the ones in the lower grades. Therefore we must consider a new approach to its presentation. The new approach should be adapted to the possibilities and needs of the students as well as their age. The new approach should also instigate inventiveness.
Gradually people started to change their old habits, to adopt new technology and to improve their life. This way the technology is penetrating into every sphere of our lives and even in our education. Information and communication technology (ICT) represent a set of different tools and resources used for creating, distributing, storing and managing information. These technologies include computers and Internet, broadcasting technologies (radio and television) and telephony. Information and communication technologies are no longer used in the administration of education, but are entered in the teaching process. The application of ICT in education enables creation and development of new way of learning. Information and communication technologies offer powerful learning tools that require greater engagement of students in the learning process and develop new skills.
The application of information communication technologies to solve geometric problems provides a new approach to their presentation. In this way, students can obtain a complete audio-visual representation of geometric problems with angles. One approach is by using interactive geometry software (dynamic geometric environments). Interactive geometric software is a computer program that primarily serves for creating geometric applets, and later manipulates with the same. There are a number of interactive geometry softwares like: CaR, Cabri Geometry, DrGeo, GeoGebra, Geometry Expression, KmPlot, MathKit, and others. In this paper the interactive geometry software GeoGebra is featured. GeoGebra is free and open interactive geometry software which can be applied to geometry, algebra, tables, graphs, statistics and calculations in a very simple way. GeoGebra software is written in Java and thus is available for multiple platforms. The development of geometric applets of angles using the mathematical software programs is interesting for the children because it gives them a clear image which pair of angles are corresponding, alternate, consecutive, which angles have parallel rays, which angles have perpendicular rays and which ones are equal or supplementary. The software use different colors to represent objects of design, and most importantly can move the angles in order to test if they are equal or supplementary.
The integration of newer information and communication technologies, computers, Internet and Web has enabled rapid and easy way to distribute and share information and data. We previously mentioned that communication is very important for the educational process. Therefore the developed interactive geometric applets for angles will be placed on the web using the service PBworks. PBworks unites more than 300,000 educational workplaces and thereby helped in transforming teaching and learning for millions of students, teachers and parents. PBworks is very good with group and with individual projects as well, wherein students can log in via e-mail or through their school accounts. PBworks provides complete control on the work of the students, because it remembers every change made on the space. PBworks does not permit abuse because it offers the possibility of controlled access to the workspace. We

can determine which students will regulate the working space, and which ones would just review, because PBworks provides different levels of access like reading level, writing level, regulation level and administrative level. Starter edition of educational PBworks is free and offers a working space which can contain 100 users and offers up to 2GB of storage space.
The purpose of this paper is to offer a new way of solving geometric problems with angles, using information communication technologies. So by using interactive geometry software GeoGebra we will elaborate geometric applets for angles, which will be later placed on the working space of PBworks.

WHY ANGLES

Geometry is a part of mathematics, concentrated on issues related to the size, shapes, relative position of figures in space and properties of space. Geometry is one of the oldest sciences because the basics of practical knowledge of length, area and volume were known since the third century BC when the geometry received axiomatic form by Euclid. According to Euclid an angle (or plane angle) is the figure formed by two rays sharing a common endpoint called the vertex of the angle. There are different types of angles like acute angles, obtuse angles, straight angles, reflex angles, complementary angles, supplementary angles, vertical angles, angles on a transversal, angles with parallel rays, angles with perpendicular rays etc. But in this paper we only process the angles on a transversal, angles with parallel rays and the angles with perpendicular rays.
According to Euclid parallel lines are two lines on a plane that never intersect, actually the lines are parallel if they are always the same distance apart (called "equidistant"). When parallel lines get crossed by another line (which is called a transversal), we can see that there are many angles, as in Figure 1. These angles can be made into pairs of angles which have special names. There are angles which have common vertex, angles that lie on the same or on the opposite side of the transversal, internal angles and external angles.

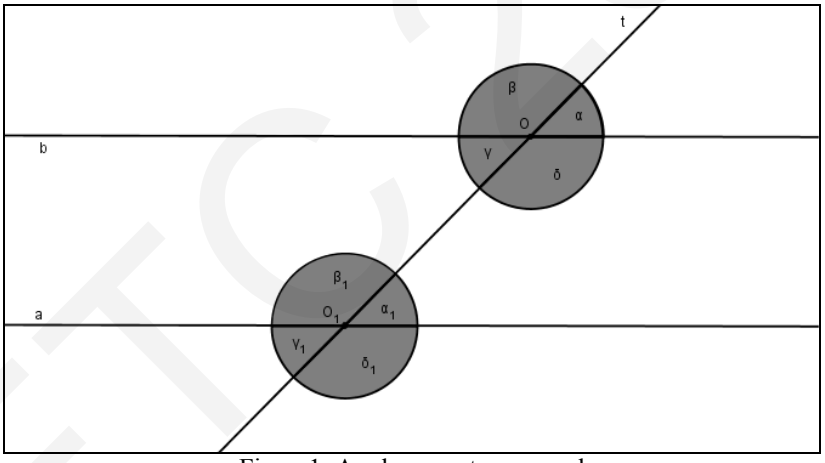

Figure1. Angles on a transversal

Two angles opposite each other, formed by two intersecting straight lines that form an "X"-like shape, are called **vertical angles** or **opposite angles** or **vertically opposite angles**. These angles are equal in measure. In compliance with Figure 1, the pairs of angles called vertical angles are: α and γ, β and δ, α_1 and γ_1, and β_1 and δ_1. The pair of angles that don't have common vertex, lie on the same side of the transversal and one of them is internal and the other is external, are called **corresponding angles**. In compliance with Figure 1, the pairs of angles called corresponding angles are: α and α_1, β and β_1, γ and γ_1, and δ and δ_1. Corresponding angles are equal in measure. The pair of angles that don't have common vertex, lie on the opposite side of the transversal and both of them are either internal or external, are called **alternate angles**. In compliance with Figure 1, the pairs of angles called alternate angles are: α and γ_1, β and δ_1, γ and α_1, and δ and β_1. Alternate angles are equal in measure. The pair of angles that don't have common vertex, lie on the same side of the transversal and both of them are either internal or external, are called **consecutive angles**. In compliance with Figure 1, the pairs of angles called consecutive angles are: α and δ_1, β and γ_1, γ and β_1, and δ and α_1. Consecutive angles are supplementary.

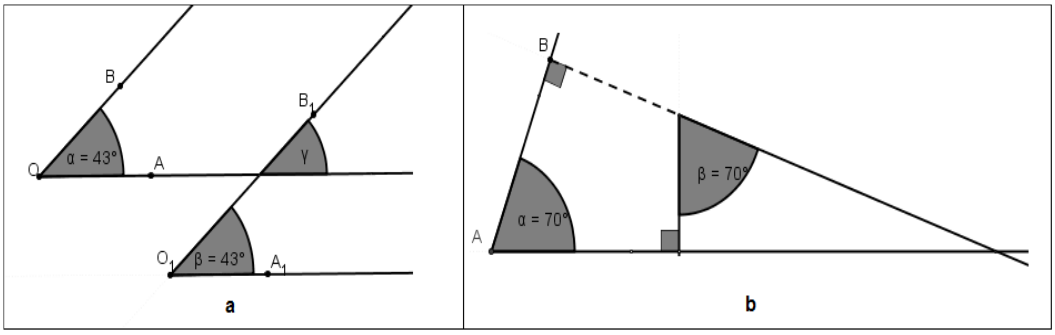

Figure 2: (a) Angles with parallel rays, (b) Angles with perpendicular rays

The pair of angles that have two pairs of parallel rays is called **angles with parallel rays**. Figure 2 (a) illustrate that pair of angles. The pair of angles that have two pairs of perpendicular rays, are called **angles with perpendicular rays**. Figure 2 (b) illustrate that pair of angles.
The angles that we presented before are used in complex geometry situations to solve geometric problems. For example very often we meet geometric problems like "Find the angle" problems, in which some lines and angles are given as problem parameters, and the student will be required to find a particular angle or angles. Also the angles that are present in this paper are used in geometric proofs. The goal of every geometric problem is to be solved by writing geometric proofs. By writing geometric proofs we realize how much we have learned and understood geometry. The materials in this paper review the basic terms and concepts in geometry, and provide lessons to help develop understanding of angles as well as their application in solving problems related with angles.

WORKING METHODS

GeoGebra applets are made and intended for Math teaching in the middle schools in Macedonia (6th grade). These applets are placed on the service PBworks:

- Angles

On this front page there are six different pages representing the lessons for all different types of angles we have mentioned before. These six lessons are listed in Table 1.

Angles
Angles on a transversal
Corresponding angles
Alternate angles
Consecutive angles
Angles with parallel rays
Angles with perpendicular rays

Table 1. Six lessons for angles

Almost all of the six lessons are consisted of:

- Reminding - of what was learned in previous geometry lessons: which precognitions students have about the old geometric concepts that will be used in the new lesson.
- Exploring interactivity – applet made with the software GeoGebra in which the angles are visually presented and gives the opportunity to change the size of the angles.
- Check the accuracy of theorem – the applet made with the software GeoGebra in which a theorem is presented about a certain type of angles, has a feature to check its accuracy by moving the angles.
- Metadata – Basic data for the construction: in which classroom activity this lesson is processed, in which strand of the curriculum, in which grade, how should it be used, which programs are required, etc.

Now we will describe more thoroughly what contains almost every lesson that is set on the working space PBworks.

Reminding

This is a introduction in the lesson, where the students under the guidance of the teacher performs recapitulation of the old geometry lessons in order to refresh their knowledge. In this section there is a picture and several questions that are in reference to the picture. These questions should encourage students to think in order to extricate and surface their knowledge. With the help of this easy method of questions and answers, students realize which precognitions do they have about the geometric concepts, that will be used in that particular lesson.

Exploring Interactivity

At the beginning of this section the new terms that are important for that particular lesson are defined. For example in the working space for the corresponding angles, there would be a definition of the new term "corresponding angle" and an appropriate example, which one from the pairs of angles are corresponding angles. Next in this section there is a geometry applet made with the software GeoGebra, in which a pair of corresponding angles is presented. In every geometry applet the pairs of angles are painted in different colors. This is a great feature of GeoGebra, because the colors are quite interesting for students and in this way they can clearly distinguish the different types of angles. Another great advantage of GeoGebra is the possibility to change the size of the angles. This is great advantage, because in this whey the students don't have to make another applet if they have to change the size of the angle. They can do this by simply moving the slider. Also the students are able to choose the geometric elements that will be displayed on the applet. For example in the working space for the corresponding angles, the students can choose whether to display all four pairs of corresponding angles, or to display each pair separately. In this way we get an applet that isn't crowded with auxiliary geometric elements, but instead the applet displays only those geometric elements that are required in that moment by the students.

Check the accuracy of theorem

In this section firstly we present a theorem about a certain types of angles. For example in the working space for the corresponding angles the theorem states "Every pair of corresponding angles is equal". Then there is a geometry applet made with the software GeoGebra in which the theorem is presented. With this applet we can check the accuracy of the theorem. In this applet there are four sliders, one for each pair of angles. With the slider we can move the first angle from the pair of angles to the second angle from the same pair, in order to check whether they overlap, see Figure 3 (a). In this way we can prove that two angles of the pair of angles are equal. Or we can move the two angles of the pair of angles to a specific position, to check whether their sum is equal to 180^0, see Figure 3 (b). In this way we can prove that the two angles from the pair of angles are supplementary. In this way with a simple movement of the slider we can check the accuracy of the theorem. This excellent opportunity is made available by the program GeoGebra. With this program we can do many interesting dynamic applets, where we can move elements. This movement is enabled using the slider and several additional points that have variable coordinates whose value depends from the value of the slider.

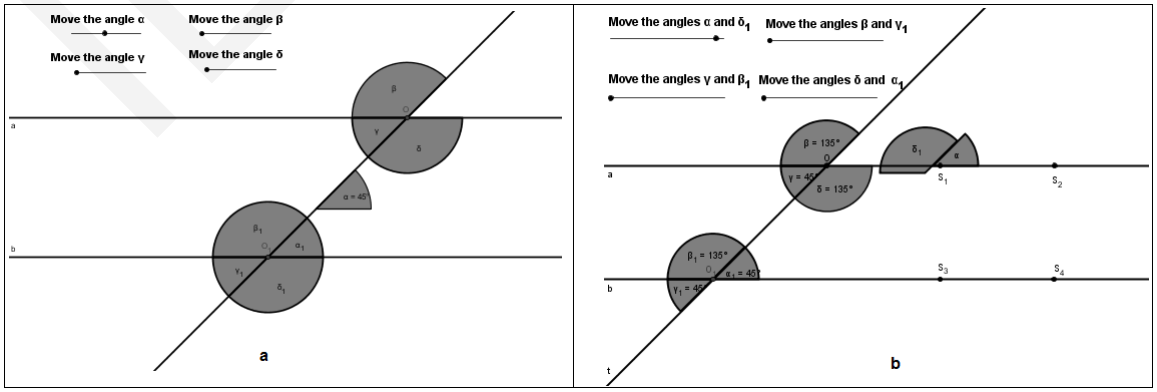

Figure 3: (a) Movement which proves that the angles are equal, (b) Movement which proves that the angles are supplementary

CONCLUSION

Creative and innovative applications of information and communication technologies (ICTs) are important tools to ameliorate the education. The explosion of the Internet in the 1990s, the emergence of a variety of low-cost computing devices and the increased diffusion of computers throughout society, ushered "ICT in education" projects to prepare students to effectively engage in the information age. ICT can be used to improve the quality of education by enhancing educational content development, supporting administrative processes in schools as well as other educational establishments, and by increasing access to education for both teachers and students via remote learning. It offers opportunities for students and young people, particularly those living in rural communities, to broaden their horizons and improve their employment prospects.

In this paper, we present how to use the ICT tools to develop new approach in the learning process of angles. For that purpose we use mathematic software GeoGebra and service PBworks. As previously mentioned, the students especially the novices have difficulties to understand the geometry. But in this paper we present a new and interesting way to learn geometry. According to the first impressions, students react positively to this new way of presenting the geometry – teaching geometry with ICT. During the classes students are more interested and motivated, and they like to experiment with colors. They especially show a great interest in the opportunity to move the elements of the applets.

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ECOLOGICAL EDUCATION THROUGH BIRDS FOR THE PUBLIC IN IASI BOTANICAL GARDEN (ROMANIA)

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Abstract
Iasi Botanical Garden, the oldest botanical garden in Romania, represents an oasis for biodiversity and people on a surface about 100 hectares in the north-western side of Iasi city. Valuing the experience of the local ornithology school and Romanian Ornithological Society Iasi Branch, we propose a new educative program in this botanical garden using the birds' presence in the area. The program include theoretical ornithological lessons, but also practical activities (birdwatching, research activities, vegetation's management to improve the suitable habitats conditions for birds, artificial nest and feeding sites, etc.), open conferences related to the large topic of environmental ethics. The program will permit us to find the best practices to improve the quality of the green areas from the city in order to preserve the biodiversity and the life quality of the local community.
Keywords: ecological education, long-life learning, birds, botanical garden

INTRODUCTION

The green areas inside and surrounding the big cities represent a special functional site depending on the vegetation and fauna, but also on the buildings and facilities for cultural and education activities, sports and recreation. These green areas have numerous functions: they beautify the urban environment giving a pleasant garment plant in the city's architecture, improve the quality of microenvironment, and purify the atmosphere of dust and harmful substances, providing the oxygen necessary for life. In the same time, the green urban areas are bracing and aesthetic environments for physical and mental recreation of the big cities' inhabitants. At last but nor without importance, these areas present a theoretical and practical interest for the scientific investigation and biodiversity protection.

In the actual context of increased environmental degradation and natural population decline recorded by many groups of plants and animals, the green urban areas become true refuges for ones of the wild species. During the last decades, the specialists have focused their efforts on the diversity and ecological aspects of the green areas' perimeter trying to understand the subtle mechanisms that ensure the functioning of these artificial ecosystems extremely ecologically fragile.

Iasi Botanical Garden is the oldest botanical garden in Romania and covers a surface about 100 hectares in the north-western side of Iasi city, representing the greatest green area inside Iasi city, a true oasis for biodiversity and people equally. The botanical garden serves as a fixative and anti-erosion plantations on a territory prone to landslides, protection for the water resources, and climate protection barrier against the adverse strong winds and excessive temperatures. Since its establishment, the Iasi Botanical Garden is a particularly important milestone in the life of the city of Iasi, but the valences of educational institution are not valued enough thinking about the present and tradition of higher university education opportunities from this city. We must mention that the administration of the Iasi Botanical Garden is taken in charge by "Al. I. Cuza" Iasi University.

During the last two decades, a strong ornithological school developed in the "Al. I. Cuza" Iasi University in good partnership with the Romanian Ornithological Society (SOR/Birdlife Romania). The students' interest for ornithology increased and become constant over the years, being attracted through the practical activities related with the Ornithology optional course and ecological summer camps organised with the logistic support of SOR/Birdlife Romania - Iasi Group. Numerous groups of children have participated in these summer camps organised in Vladeni wetland area (Jijia and Miletin Ponds SPA in Nature 2000 Network), demonstrating a willingness and interest to spend few days of their holiday involved in environmental and ornithological education activities. Many of them became students in our university, taking bachelor in biology, geography and geology areas.

We must notice that the Iasi Botanical Garden, with it twelve sections, represent a huge mosaic of habitats, providing food support varied and numerous favourable places for refuge and nesting birds – during the last 20 years, we recorded 107 bird species in the area, 72 being breeding birds in this perimeter (Gache, 2007), these diversity presenting variations from one year to other (Croitoru, 2009).

All this argues permitted us to propose a new educative program for the public of this botanical garden using the birds' presence in the area and the experience of the local ornithology school and SOR/Birdlife Romania - Iasi Group: *Iasi Botanical Garden, refuge site for birds in our city*. This program will provide

ecological and ornithological lessons outdoors in nature, in a safe location near the house and any potential lover: Iasi Botanical Garden, supplying, locally, the absence of a true national environmental education program.

AIMS, ACTIVITIES AND METHODS

The principal aims of our educative program are:

1. Launching new educational and recreational offerings in the Iasi Botanical Garden by initiating an ornithological and environmental education program to the visitors representing various age groups, and different socio-professional categories.
2. Creating a database on the diversity and evolution of bird fauna in the Iasi Botanical Garden.
3. Improving suitable living conditions for populations of birds present on the Iasi Botanical Garden's territory.
4. Public involvement in the actions of knowledge and protection of birds and their suitable habitats.
5. Change the people attitude toward nature from indifference and carelessness to interest and active involvement in the environmental conservation programs.
6. Develop a responsible environmental behaviour of people and change the present unresponsive attitude to a friendly attitude of human being to the nature.

This permanent educational program address to the local community in Iasi city, but we expect that can attract participants from all over north-eastern part of the country on medium and long term. The running program will develop the knowledge about nature of the participants, which will adopt an active ecological attitude due the understanding the complexity of the ecosystems' functioning and awareness of the need to maintain a balance between biodiversity conservation and expansion of human civilization for the welfare of the human species itself nor only for the other living beings. Through its activities, the program will provide coverage of the priority directions in the Action Plan for Botanic Gardens in the European Union (biodiversity conservation, education, education and information, culture and tourism).

The program *Iasi Botanical Garden, refuge site for birds in our city* include the following activities:

- Carrying out a program to initiate and enhance the ornithological study, including theoretical lessons, themed games and birdwatching practical applications for various age groups.
- Identify a suitable place or build an arbour for ecological education inside the botanical garden's perimeter to conduct the theoretical activities of education program.
- Develop a monitoring program following the evolution of bird fauna's diversity and populations' trends on the botanical garden's territory.
- Develop a program to capture and ringing birds in this area.
- Initiate experimental ornithological studies in the Iasi Botanical Garden.
- Implementation of some measures of vegetation's management to improve the suitable habitats conditions for birds.
- Purchase and installation of bird feeders and nest boxes.
- Providing supplementary food available for birds during the wintering time.
- Monitoring of the nest boxes in order to identify the bird species using it, following the reproductive success of them and to assess the influence on the population's trends.
- Conducting recreational birdwatching activities.
- Building and proper planning of one ornithological observatory in the dam lake from Podgoria Copou rivulet area.
- Organising conferences series related to the large topic of environmental ethics presented by the specialists from Iasi universities, but also, visiting professors in the area.
- Manufacture and installation of presentation panels of bird species in different parts of the Iasi Botanical Garden, valuing photos from the collections of our bachelor, master degree and PhD students.
- Event activities on the schedule of Ecological Calendar (1st April – National Day of Birds, 22nd April - Earth Day, second weekend of May – International Days of Migratory Birds, 5th June - International Day of Environment, first weekend of October – European Birdwatch Days, etc.), organising birdwatching activities, drawing, essay or other literary writings competitions, photo exhibitions, cultural evenings, lectures and debates on topical environmental issues.
- Publish a *Small guide of the birds from the Iasi Botanical Garden* and a *Guide for the study and protection of birds in parks*.

Once the program started, some activities will be permanently, others will take place periodically, and some will have events character.

The installation of feeders and nest-boxes for birds will be phased both in time (over two – three years), and space (on each side of Podgoria Copou rivulet valley, from south to north) in order to use the monitoring results in analysing the seasonal and yearly impact on the birds' diversity and population trends. The feeders will be installed in September – October in different places from the whole territory of the botanical garden, including some big feeders in the area of the *Ecological Education Arbour*, *Ornithological Observatory* and greenhouses complex. The feeders' supplying will be provided weekly during the wintering time (there are recorded very cold winters, with strong winds in the north-eastern Romania). The necessary seeds will be providing by the botanical garden resources (Teaching-Experimental Section) or collected through the volunteers' participation. The installation of nest-boxes will be done during the period 15th February – 15th April, each year (but in order to avoid an effect of overcrowding, after the installation of a sufficient number of nest-boxes, it will repair and replace damaged ones).

During the first stage of the program, the active members of SOR/Birdlife Romania - Iasi Group will be the first volunteers and trainings carrying out the educative activities, installation of first feeders and nest boxes for birds in the area, seeds supplying for birds feeders and initiating the birds' monitoring schemes. By other hand, this NGO will assure the logistic support to initiate the ornithological applicative studies (binoculars, field birds' guides, nets and other means for birds' catch and ringing).

In the first month of the program, while we develop a popularization campaign of this new educational offer, after finding a temporary location in the Botanical Garden's area (probably, the outdoor arbour for Japanese Festivals), will initiate the theoretical lessons of ornithology and ecology. These will be scheduled weekly and will be associated with thematic games, applied ecological and ornithological activities inside the Botanical Garden's perimeter. The working groups will not exceed a total of 10 students following to obtain educational program effectiveness.

We will mark some ornithological routes for birdwatching activities and we will install some presentation panels with the bird species from different areas of the botanical garden territory. Recreational birdwatching activities will be organised monthly (as public required, can be scheduled every two weeks), but also during the specific events. These last will be established for each semester of year, involving the participation of students and pupils of all levels of school education (from kindergarten to high-school).

There it will be a monthly program of conferences included in the series related to the large topic of environmental ethics; the speakers, theme, location and timetable will be publicized in local media, on university and botanical garden websites.

The ornithological research activities will involve high-school, bachelor and master degree students and will have regularly schedule, organised like a component of the monitoring and experimental ornithological studies. All the data will be included in standard forms, adapted to each kind of activity (studies on birds' diversity evolution, birds' population trends' monitoring, nest-boxes and feeders' monitoring). The students can use these activities in order to prepare their bachelor or master degree thesis, but also in different competitions of projects on environmental topic. The scientific results of the program can be valued also through scientific meetings.

This project will permit to strength the existent partnership between our university and SOR/Birdlife Romania. We can use nor only the experience of the NGO' specialists and members, but the central office can provide logistic support for feeders and nest-boxes' manufacturing. We will develop partnerships with other educative institutes in order to involve a large number of children, but also their parents and grandparents, in this ecological education program, including through the development of small environmental projects done by children of different age levels. We are thinking to attract retired professors but also other retired people categories that enjoy keeping their active spirit and human contact in the activities of this program.

The experience gained through this program will permit us to find the best practices to improve the quality of the green areas from the city in order to preserve the biodiversity and the life quality of the local community. We can share this experience with the local authorities implementing part of the component developed in our program in other green areas from the city, for example, installation of feeders and nest-boxes for birds, vegetation's management, etc. that could improve the environmental quality nor only for birds, but for biodiversity generally.

RESULTS AND FUTURE STRATEGIES

The Iasi Botanical Garden will develop and strength it position like ecological education centre following the biodiversity's conservation *in situ* in Iasi city and north-eastern Romania. On medium and long-term, this project's development could motivate a large number of young students to choose the "Al. I. Cuza" Iasi University for their bachelor and master degree studies, developing the research skills and aptitudes

of children, including the communication abilities through team-working activities and experience changes with people of different ages and social-professional areas. In a second stage, there will be organised summer ecological camps for gymnasia and high-school students from the whole historical Moldova region (eastern Romania), for children with poor possibilities, including from orphanages. The children will receive accommodation in the university campus. Publicised around the program' activities will provide additional image growth for both institutions, Iasi Botanical Garden and "Al. I. Cuza" Iasi University.

The program's results will permit to improve the management plans of Iasi Botanical Garden in order to design and implement vegetation's arrangement to preserve the bird fauna's diversity, but also to develop the educational strategy of this institution.

The program development will attract a larger public in the botanical garden and will permit to provide additional funds through special subscriptions (*Ornithological lessons*, *The dawn song*, *The owls' nights*, *Conferences series*, etc.) or through events organised to collect funds in order to initiate mini-projects of students about different ages.

The participant public, but also the passive visitors that will see the educational program's results can value the new knowledge and experience in their own garden or inside the green areas surrounding the blocks of flats, determining an improvement of the environmental quality in Iasi city.

In the future, we are thinking to improve the recreational offer of the botanical garden installing small video-recorders inside the nest-boxes or close to the bird feeders that can provide scientific data but also images that can be projected on large screens installed in the area of *Auditorium* building or *Summer terrace*, projected to be developed in the Iasi Botanical Garden during the next years.

CONCLUSIONS

The Iasi Botanical Garden represents one of the most important green areas inside Iasi city, a true oasis for people and nature in the north-western side of the city.

We propose one new ecological education program for the public of the botanical garden using the birds' presence and diversity from the area. The birds are ones of the more attractive animals through their appearance, songs and behaviour.

Once the program started, some activities will be permanently, others will take place periodically, and some will have events character.

One of the principal aims is to involve a large number of children, but also their parents and grandparents, in this ecological education program.

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EDUCATION AND THE FUTURE MODERNIZE

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ABSTRACT:

Changing technological and social structure based on it, makes changes on educational programs. New forms of education and training programs are in the process of change. The learning environment, the introduction of new technologies in the class are forward-looking shape.Educational technology which has been started via pictures in caves, pictures, movies, radio, TV, the combination of the computer medium output, a combination of Internet and TV, today is shaped by 3G and 4G, develops. Iphones offers two way communication on education, and learning environment . Teaching and learning environment uses , computer, smart table, wood tablets and smart classrooms. Technology changes teaching and learning features. The school offers individual, effective and productive teaching . School organization changes. Faculties of education develop teacher training programs for schools in the future .
Key words: Training programs, new technologies, education, environment, education technologies.

YENİLEŞEN VE GELECEKTEKİ EĞİTİM ÖĞRETİM

ÖZET.
Değişen teknolojik ve buna bağlamlı sosyal yapı, eğiti programların da değiştirmektedir. Eğitim ve öğretim programları değişim sürecine göre yeni biçimler almaktadır. Eğitim ortamı, yeni teknolojilerin sınıfa girmesiyle ileriye yönelik biçimlenmektedir. Mağara resmiyle başlayan eğitim teknolojisi, resimler, film, radyo, TV birleşimi, bilgisayarın orta çıkışı, internet ve TV birleşimi, bugün 3G ve 4G ile biçimlenip gelişir. İPhonlar eğitim, öğrenme ortamına çift yönlü iletişim sunar. Öğretim ve öğrenme ortamında, bilgisayar, akıllı, masa, ahta, tabletler ve akıllı sınıflar kullanılmaktadır. Teknoloji, öğretme ve öğrenme özelliklerini değiştirir. Okul, bireysel, etkili ve üretici öğretimi sunmaktadır. Okul organizasyon değişir. Eğitim fakülteleri geleceğin okulları için öğretmen yetiştirme programları geliştirir.
Anahtar Kelimeler:.Eğitim programları, yeni teknolojiler, eğitim ortamı,eğitim teknolojileri.

Introduction

Education, training and technology experts group emphasize the exchange of education, training and learning environment; like changing the speed of light and in designing future processes. (Cass, 1957).This article is trying to explain a combination of education, training and learning technology. More than terms and concepts, changing life of education, training and learning environment are asked to mirroring.

Education, teaching and learning emerges in; perception of sense in talking, made the transition easy transfer of information, attracting the attention of saying the words used in life and life (Yüksel, 2008.S.135-138). Educator is different from other people while understanding, explaining and interpreting the terms of education.

When the student go into the class, he or she face to face someone who is trying to teach and tell unknown objects. The student learns with repeating the symbols which written by the teacher on the board. (Tuna. 2008.S.244-257) World War II political and economic blocs in technology have increased competition (Varış 1987). In schools Education, training programs, lessons, subject, book, etc. becomes individual approaches.

Out in the launch of Sputnik in 1957, accelerates the use of educational technology education in schools. This removes the U.S. in the 1920s the subject the prohibitions. Ministry of Education after 1980 ban on school programs put topic (Ece, 1994.S.43-47) (Varış.1987). This function, being at school; speaking, understanding, perception, comprehension, synthesis, analysis and interpretation of his contribution to education, learning and teaching equipment and materials affect the environment

Countries, education, training and learning social, economic, cultural, and reveals the future, depending on perspective. Branches of science and technology in the face of change, academic programs, changing and evolving. Training and education programs, updates, future-oriented change is made. No. 28 indicates that the document put forward by UNESCO. Here, student expectations, learning environments and teachers' roles change (Dogan, 1987, Ece, 1994).

J. Tannery (New York City education director) in his speech about education programs, social development would be with Education, emphasizes happen with the improvement of skills and education investments will be made pipe type (Souche, 1957, s.147).

Illich, schools will not engage in the learning environment, his work indicates that universal education. He refers to the establishment of networks for solving educational. Illich, education programs, development and regulation of the investment in education will be noted, in a region the equality of education, family economic power, the environment and form bonds to benefit from technology. Within the same school, same program, the differences of those who continue, the world view, self-reliance, loyalty and despair of poverty indicates that the future of socio-cultural developments forward. Illich, schools, students in Mexico in 1956 as an example enough taught and G. Morris' s as a result of a one-week orientation, different groups outside the school shows up to teach Spanish to people every six months. Cost differences between countries, human culture, his work reflected the individual's knowledge, manners, socialization and the development of skills will be put out (Tan. 1983-p.45-59).

Social changes are inevitable process of social mobility. Cases indicates that this important historical turning points. For example, the Treaty of Kadesh, the Crusades, the Renaissance, the Reformation, the Geographical Discoveries in the Age of Enlightenment, the French Revolution, the Industrial Revolution, I and II. World wars, space wars. These are autistic and changes in foreign viewpoint social improvement of the technological development, changes and developments affecting the societies. This is the clearest example of the interaction, the need for paper because of the increase in literacy is the opening paper mill. Changes and

developments in the social and individual, emotional directions or economic features, cultural and social conservatism indicated to have an effect. Here, the teacher plays an important role in the social, economic, technological change and development (Ata. 2008-s.1-11).

In education quality, between countries and societies of social economic, technological creates privileges. This social change, as well as development, economic power is also effective. By developing technology, developing communication tools, weapons creates a strong impact on the environment (tells the history, 1994).

Human, the relationship between information exchange, socio-cultural and technical change in society, it also affects the change in the quality of people. Scientific results of the implementation of the 20th century technology has shown rapidgrowth and change. Technology and economy of countries is important in the race each other to establishdominance.

Knowledge and the rapid increase in technology, science, scientists education, training and learning methods in terms of models routes to create new teaching environments (Alkan, 1998, p.1-2)

Modernization or the day and the days ahead, in terms of education, considering many factors necessary to examine the education and training environments. These aredemocratic, scientific, economic, social, political, universal features (Alkan, 1998)

If you take the democratic feature of them, the country's population growth, internal, external migration movement, education and training institutions and the power of media to respond to it, should have the power of monetary support. These norms and the norms of six rapid fluctuation with higher-quality supervised support, active individual and society, ensures that producers and consumers (Alkan, 1998, p. 3 Bahri Ata, s.249-275). Countries within the framework of democratic development, underground and above ground resources to develop their own resources towards the right, to seize the resources of technical, economic, social initiatives. To this end, countries have to know, give importance to the development of technology and education.

Scientific, Technology, Educational Developments

Knowledge of science is the fundamental backbone. Theoretical research, new information to be derived from antiquity to this day, the combination of information technology in the 1700s with the emergence of technical, engineering, education, institutionalization reveals. Acting schools teach and learners forces to reach the newly formed agency information.

The industrial revolution, technical, technological invention and innovation is the addition of the results and production industry.

Communities in the development of the printing press provide differentiation in terms of social, technical, economic, education and training. The camera's presence, silent and sound films' effect of the society, the social environment changes, the school will cause a change in the teaching environment. The presence of the radio transmit a wide audience with her knowledge, education and training to be used. The presence of the radio transmit a wide audience with her knowledge, education and training to be used. This black-and-white TV, then the with color change in society and the individuals he observed behavior.Then the computers appear in the field of education. Computers were being started seen in all areas of society. Because it can solve many uneasy problems. Accordingly, the use of Internet networks, the possibility of using the Internet and two-way one-way flow of information, education, equality and social aspects of individual support, training, education approaches in their environment, as it occurs later in life-long learning environment (Kaynakçalan, 1994. s.57-60).

Science, research on the issues, observations, and an examination of judges. The judiciary, technological, economic developments and inter-cultural diffusion varies with. Dogmas, the research not be the result of observations and investigations. Discussed and interpreted universally accepted that there are both semantic and patterns of development closed. Between birth and to look for the facts and the science of human nature which will be dominated by the superior decides. The decision to train manpower and cross-country race that will power is knowledge. The school developed the information is transferred and the production environment and culture. School knowledge, behavior, and I could benefit from training programs to improve gradually prepared. Allows the development of educational programs in developing curricula.

Sent to the launch of Sputnik, the United States until the end of primary school, high school science courses in biology, physics and chemistry courses and content that matters will change in the future. Change, training program, an individual's life and establishes a link between socio-economic and technical. Education programs, the national socio-economic development of the country's manpower requirements are structured to cultivate. Changes, for further change within the school, the school is reflected in non-advanced for the development. Visual, auditory, audio-visual communication tools and materials printed documents with this image promotes. During the life of the individual and society when they are living in contemporary newspapers, magazines, books, radio, films, television, computer and electronic

communication tools, a school (education environment) falls into (Alkan, 1998, p.4-6; Ece 1994-s. 43-47).

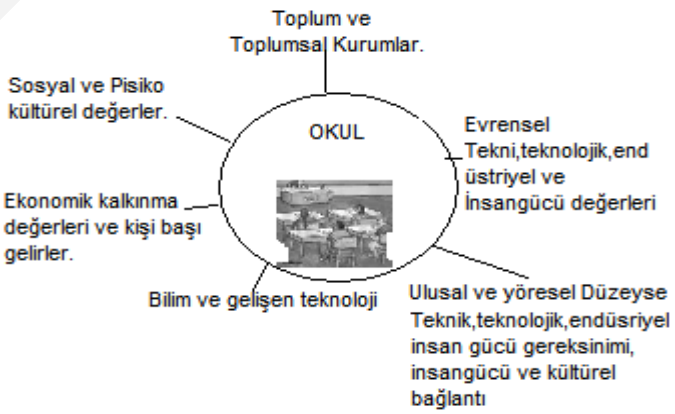
Education, the national socio-economic development of the country to train manpowering need of state. Current life of the individual and society, newspapers, magazines, books, radio, films, television, computer and electronic communication tools, a school(educational environment) into a reduced (Alkan, 1995; Ece 1998-p.4-6).

A matter of the relationship between scientific and technological education and education and society, as previously documented in recent years with rapid change and development of education among the community affects the message between education and social. Today, if western countries can say about 2020, 2030 years of teaching and learning, and technology, this is indicative of the importance given to human and human power. Science, technology, economic development and progress sets out the changes and development in education. Society, values and quality of trained manpower which carries a value (Brunner, 2009:Alkan, 2005).

What are the groups waiting to happen?

Education and training point of view, sets out the functions of social institutions which way you look at the school. To make the desired level, is an ideal teaching and learning, school environment, the quality of teaching, learning and teaching facilities should be plural. Clutches consist of a concrete education and training technologies. Month to show people, the missile up output, the theoretical demonstration of the work on Mars is more effective than Speech. The student is not an abstract scientific values, the concrete values should be taught Today, the visual power of audio-visual and electronic communication, computer, offers individual learning in every corner.

Figure :1 Interaction of the school area, the main sources.



Community groups use the computer to know the various directions, training programs, educational institutions and expectations, forward look in terms of social development. Education institutions to the needs of the country contributes to a balanced distribution of socio-technical and economic sophistication (Alkan 2005; Fares 1986; Baytekin, 2004). The individual's education, training and education in the visual, auditory, audio-visual instruments should be noted that his contribution. Printed tools, slide images, painting, film and film strips, radio, telegraph passing the phone from there and from there to television (TV) of social and industrial life, the visual and auditory activity, education and social formation is rapidly orbit.

How is the development of TV?

Let's talk about development of tv shortly.Paul Nipkow's electric telescope in 1885 and the Russian Boris Rosing's first broadcast in 1907 takes an important place in the countries. The first electronic TV in 1906 in Germany Max.Dieck M., March 22, 1935 in high definition TV is offered regularly. PAL system, "Pay additional Luxury" great American NTSC (Never Twice Same Color) or (Never The Same Color) color televisions in the background of the political development of the common interests of political ideas to face the day revelation (Fernsehen, mobi, 2010). Satellite TV broadcasts are seen as the beginning of the year August 12, 1960. Satellite communication begins. TV and digital broadcasting can not be bypassed again. Helmut Thome ct through application of television broadcasting via the Internet eliminates the limited environment. Today, it is possible to watch internet TV channel of many. In 2007, a new mediathek ZDF TV (technology, environment) throws publication of the draft. Germany in 2010 to digital TV broadcasts (bidb.itu 2006, Fernsehen, mobi 2010). Life-long learning, TV broadcasts, taking advantage of open education and distance education tries to reach a wide audience.

According to statistics, 95% of the people still watch TV in Germany. The 1950s until this day, some homes are more than one TV. Statistical Institute of Turkey according to 2009 data, 90% of people watch TV. Some people have more than one TV at home (Fernsehen, mobi, 2010) To have the TV audience at this rate, socio-cultural society, sets out the contribution of technical and economic mobility.

Letter of instruction to take the radio support, then the TV and More provides support. Radio and TV educational programs and the development impact of development in the walk through the positive and negative direction. Managers of the managers of this country's form of organization of radio and TV is limited (Demiray-Binatlı, 2007). TV hinders an individual's reading habits (Ministry of Education Reports) is indicated. Reading habits of school is given in advance. Reading a book is a socio-cultural feature. Per capita book reading: Japanese year 25, Switzerland 10, Turkey stated that only 6 people read only one book (Yapıcı.2006). Individuals

due to less reading, training and education to benefit from the format of her work with the family and the school to read.

Education in Turkey: The first application as the first TV broadcasts in Turkey by the Istanbul Technical University students begin publication in 1952. (Çilenti 1979 s.151-167) . Between the years 1970-1973 is school TV programs.In 1968 TRT publication of the trial begins, and publicates entertainment and news broadcasting, in adult education.YAYKUR ends in 1976, starting in 1978. 1982-1983 academic year, AOF (Open University) education through broadcasting (Constructive, 2009 p.12-13).

Many national and local TV station is live in Turkey now. These are outside the general education philosophy of education publications give weight to their own philosophies. Aided schools, TV and TV-video combination of courses and course content are presented with the support of technology. TV-integrated technologies, more common still brought down from the school's classes and portable computers. Today, all over the world to track the TV program on your computer.

From TV to the Internet.

In 1936, wide screen images, video projector (Beamer) is used with the Olympics. Bill Gates expects a lot of people to watch television from the internet. In the study of young people to follow television sets out the help of the computer Internet. Man is aware of what is happening all over the world in a broad spectrum. The lives of Education and training also benefited the power of the Internet (Fernsehen, mobi, 2010). With creating equal opportunities for learning and teaching, television combining the power of the internet opens the more common social space. Television, although one-way transfer of information, lack of teachers or teacher's taking place in underdeveloped in terms of information accelerates social development. Integrating with Internet and web-based learning , creates a collaborative learning environment (Sahan 2008. s233-234).

Technology Is In The Classroom

The schools no longer remain trapped in traditional thinking patterns. While nanotechnology shrink laptops became widespread, the student, can access the information at its own discretion. Changes in the classroom, students' computer use in class, the class Web site to share thoughts and feelings, Bolk and accurate access to information and knowledge sharing by creating a Wiki groups make joint efforts. By inserting new information into the visual creates a class discussion with the Wireless. Individuals everywhere to make information sharing (wikipedia.Educational Technology. 2010) has a chance.

Sent to Advertise 98 technical magazines in the journal Medien, with seeing the electronic board, I thought that schools will start a new revolution in education. Instantly I shared the innovation with students in the faculty.I received my books the picture Students made the boxes for future computers and they presented texts describing their work and they told them on the board in Kocaeli. Some people laughed a lot in this event, from time to time had made cynical jokes. All of them are looking to the future and form of the country.

Figure 1: From the tablets to the smartboard transfer. (Tayfunyildiz. com. 'from thereceipt.)

Schools, bringing the format to minimize blackboard and chalk to electronic covered wooden (Smart Board) constitute a better teaching and learning environment. Touch-planks and developing educational programs to enrich learning in the classroom (wikipadia. Edcational Tech-nology. 2010)

Schools ten years ago, gets rid of a wired network. The school education has continued to work with technological tools now working in the wireless network. Since 2005, schools in the 21st century provides support for integrated education technologies to students acquire knowledge and skills. Schools require students technological literacy. Television channels, handheld computers, closed circuit, on line (e-information

management) is now provides two-way learning on mobile phones for students. This changing and improving technology to increase the quality of the teacher's knowledge reveals the possibility of the technology available.Play an active role in learning computer technologies based on the integrated course. This increases the need for primary school students to write their education programs for the more advanced (google.com 2010).

Teachers, information about technology refresh, to use new technological tools, new teaching and learning in the classroom with new technology methods, techniques and strategies will prevail. Teacher will provide students meeting the technology, will implement a flexible curriculum, will look for new methods for classroom assessments. The teacher is very active and function of integrated technologies, the students will implement and make available in the classroom.In the meantime, the profile of student, will change in terms of the student's features. Schools now have computer classes, Information technology classes, computer-aided instructional environment.Users can use e learning Teachers at the school, parents, children to

the school to follow up, may have information about what he learned (edt, Baytekin 2009). The school is considered to be equipped with Web and Internet-based networks (meb.gov.tr. 2010)

Web-based learning and the use of smart technologies, Mobile Internet Technologies (MIT = Mobile Network Technologies (HAT)) the use of web-based e-learning are settling in school and classes. The new digital learning and teaching materials are also guided for their development.

Reflection of Content to New Technology Courses and Programs

Developing digital and embedded computer technologies earned wealth to learning and teaching in the school environment. Wealth of learning and teaching environment, primary education up to secondary education and higher education curricula of training programs to increase variety in the courses, course content, makes changes and additions of new information. Courses to diversity, led to the emergence of new professions, new course content. Course hours increase, according to this school's physical structure and organization of the diversification of elective courses is on the agenda. Physical structures are formatted according to the new technologies in the classroom. Student desks, teachers desk management, board and so on. according to integrated technologies, configure changes. Is that different digital technologies. Johanna Richter. Descriptions, Margret Rasfeld school and entrepreneurs are creating a revolution in learning. Primary to higher education is composed by. (google.com. vimeo.com).

Tablet learning, mobile technologies (Mobile Technology (MT)) HT, 3G, 4G, after the 'use of lifelong learning in developed countries, increasing the balance of learning opportunities. Notebook computer classes, wireless information networks inside and outside the classroom without walls to reach a view of the schools. . This individual competence, capability, creative power, increases the power of collaboration and research. Prepared by hypertext programs, in imitation learning, experiential and practical learning are used in a wide range of spectrum. Courses and content are shaped by the future.

Figure 2 Table users can use the touch screen more than one person from www.google.com

Individual, be able to use the knowledge and training their own lives.According to these parts of the course is going to teacher training institutions and timetables by the new construction styles. According to demographic growth in student schools, classrooms, vehicles, equipment and training and equipment is increased.Rapid growth and new classes of students in classrooms and schools, making the class made bellows brings into consideration. In terms of teacher education compulsory and optional courses in branch and second branch must be placed in Faculties of Education. This international competition will demonstrate the quality of teachers, quality teachers will grow.Will reach new heights in teacher training.

Finally the learning and teaching and communication technology race: iPhone rival transmission technology will be the new smart phone Palm Pre. Palm company, WebOS, users such as iPhone, but will offer an improved interface. Human element should be educated according to the future of technology and social life in the years 2025 and 2040. Education administrators, and teacher education and training programs accordingly, growers, according to the measures they must to use integrated technologies by 2040.

Conclusion

From Zigurats of Sumerian, clay tablets used by the students over there and start training courses in technology through many stages. Appealing to the Eye, the ear and the eye-ear development of tools, materials for the development of these socio-technical, economic and cultural development accelerates. Technological race, realizes the development of countries and exchange of training programs. Countries types of schools and programs, making changes for the future. Integrated technologies for the years 2020 and 2040 reveals that educational development. The school curriculum in the content of this concocted by rapid mobility. introduction of technology into the classroom, increase learning effectiveness. Students develop skills from .1950 is entering the next technology classes and quickly made plans for future schools.

Computer to the Internet, Internet TV, incorporating the internet, smart boards and classroom teaching element of the smart classrooms on deeper changes are inevitable. E-learning and e-teaching and teaching after-school classes from the smart board and taking out new developments, methods, techniques and strategies to provide the exchange of . 2025 and 2030 school years the **faculties of education is done to train the teachers**

What can be done?

Primary to secondary education until the end of classes, making use of new technologies. Done according to requirement of manpower in the future of secondary education. Supposedly, the eye is not really to teach Turkish and foreign language teaching technology, according to the arrangement accordingly. Quantity to give up on teacher training as a pass, to focus on the quality of teacher training. Farabi on this subject, out of Bey to Kochi, Namik Kemal Ali Pasha from the e, Satish guys, out to Baltacıoğlu and J. Dewey, A. Kühne, etc. Congress of Education reports the first four matches and practices of Ataturk, and other education benefit from the views of scientists.
Training and education programs in schools and types of each segment according to the modernization of today's and tomorrow's technologies and social constructions. Necessary for the country to the human type on the necessity of teaching programs and their appropriate use of new technologies should be avoided.
This is done with teacher quality.

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Effect of Self-Worth and Parenting Style on the Planned Behavior in an Online Moral Game

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Abstract: This idea of integrating moral education to digital gaming platform had been discussed since digital and online approaches were used in teaching. Online interactive instruction was one of moral teaching forms to assist moral instruction. However, most moral-related interactive online games lacked functions for players to explore themselves while game playing, that resulted in less participation in deeper learning and decrease understanding of moral values. Therefore, we, digital game-based learning lab of National Taiwan Normal University, developed the interactive moral online game, named 'To do or not to do', to help students explore and establish appropriate moral values. Results of Partial Least Squares (PLS) analyses indicated that behavioral intention was significantly influences by behavioral control, self-worth, attitude toward the game, subjective norm and parenting style.
Keywords: self-worth, parenting style, theory of planned behavior, learning and teaching with technology, e-learning

Introduction

Based upon previous studies (e.g. Apple, 1989, 1993; Giroux, 1983a; Gordon, 1991), Yuksel (2005) reported that there are two sorts of curricula in schools; first type refers to 'official curriculum' which consisted of well-written objective, goals and activities; the second type is 'hidden curriculum' which conveys rules, values and implied messages teachers pass to students. According to Yuksel (2005), Kohlberg, the educators and the first researcher, focused on hidden curriculum in moral education. Kohlberg believed that both formal and hidden curriculum provide a ground for the moral development of students. Students experience resolution of ethical conflicts or dilemmas which lead them to the next moral stage. The course of moral development is from a simpler idea to a more complex idea, it is a progressive development.

The internalized value has been placed an important role in children's moral decisions in different

domains (Costanzo & Fraenkel, 1987). However, students are taught with values that they are demanded to learn through class lectures. Earlier study done by Pounds (1969) stated that problem solving as "choosing a model, comparing it to reality, identifying differences, selecting a difference, considering operators, evaluating consequences of operators, selecting an operator, and executing an operator"; and transforming a given situation into a desired situation or goal (Hayes, 1989). For the purpose of the study, research participants were put in a moral dilemma which can be seen as a way of presenting problem, exploring the appropriateness of moral for an individual or a group to deal with values relating to human conduct, with respect to the rightness and wrongness of certain actions.

With concerns about the rapid increase in the incidence of misbehavior in elementary schools, researchers have turned their attention to ways parenting dimensions affect children's moral education. Past researchers had demonstrated that parents influenced children's development of cognitive belief structure (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). With the structure children possessed, they conduct their behavior and then form characteristics of themselves and others (Grusec, Goodnow, & Kuczynski, 2000). Therefore, the examination of parenting style on children's ways of thinking in a situated game which consequences-based normative moral problem-solving technique (Hooker, 1996; Lucas, 2000a) was embedded might be helpful to better understand children's insights.

Currently educators face challenge to strike a balance to the moral development of students and the academic achievement of students. How could teachers prepare students not only actively participate in the environment but also make their own choice with justness, and accuracy? How could we develop a program or a curriculum of moral education that encompass the universal morality for use in both school and family?

For the purpose of the study, an online moral game was developed to provide moral-related situations relate to students' life, and question them with different situations and events enabling them to think creatively and critically, test their tolerance, honesty, and problem-solving tendencies. We examine the relationships among self-worth, parenting style and the planned behavior by using this online moral game.

Theoretical Framework

Moral development

For researching whether moral reasoning develops in a predictable sequence, Kohlberg (1981, 1984) provided research participants with 'hypothetical dilemmas' that often put the value of life against the value of someone's life, or put the value of one individual's life against the value of several people's lives. Kohlberg concluded that moral reasoning occurs in a sequence of three levels. Each level includes two stages, for a total of six. According to Kohlberg, every child starts out at the pre-conventional level, reasoning strictly in terms of ego-centered considerations. The child initially focuses on avoidance of punishment and obtainment of rewards (Stage 1) and then on satisfaction of self-interests (Stage 2). Next follows the conventional level and a shift to group-centered considerations. Here the focus is on adhering to the norms of family and other groups to which one belongs (Stage 3) and maintaining social order (Stage 4). The third post-conventional level goes beyond both the self and one's society—reminiscent of the Piaget adolescent's perspective. Here the emphasis is on democratic procedure and social utility (Stage 5) or universal principles pertaining to justice and individual rights (Stage 6).

Self-worth

Once a person recognizes the self as an individual and separate being, he or she begins to construct a 'self-concept' which refers to how that individual perceives his or her 'self' to be in terms of ability, value, and limitations.. Hater (1990) defined self-concept as an individual's perception of the combination of different aspects of the self and thus it was viewed as a multidimensional construct.

Coopersmith (1967) proposed a construct to assess self-concept by combining an individual's self-evaluation across items of various domains. Crocker, Luhtanen, Cooper and Bouvrette (2003) identified seven Contingencies of Self-Worth Scales (CSWs) including: others' approval, appearance, family support, academic competence, virtue, competition, and God's love. Parental values might lead children to experience domains and use the structure to build and judge the content of their contingencies of self-worth.

Parenting style.

Baumrind (1967) was the first researcher developed the concept of parenting styles which she referred to authoritative, authoritarian, indulgent, and neglectful. Authoritative parents required children to follow their demands, and they recognized the flexibility as well. Authoritarian parents required children to follow

their demands, but these parents were not responsive to the children's perspective. Indulgent parents did not require children be responsive to their demands, but they were responsive to the children's perspective. Finally, neglectful parents neither require children be responsive to their demands nor responsive to the children's perspective.

Past study done by Maccoby and Martin (1983) reported that parental warmth, emotional support, appropriate autonomy, and clear communication lead to positive developmental outcomes in children and adolescents. Moreover, children who are raised in authoritative homes have high scores on social development, mental health, and self-esteem (Baumrind, 1989; 1991; 2005).

Theory of planned behavior.

Theory of Planned Behavior (TPB) was developed to state that one's behavior can be predicted by his or her intention (Ajzen, 1991). TPB focused on that intention affects human behavior, whereas attitude, subjective norm and perceived behavior control affect intention. Attitudes are the feelings of acts for likes or dislikes. Russell and William (2007) defined 'subjective norm' as "the summation of the similar relationship between the strength of one's normative belief about the likelihood that important referent individuals or groups approve or disapprove of performing a given behavior and one's motivation to comply with referents" (p. 1575). And finally, perceived behavioral control can be predicted by the summation of one's control beliefs and one's perceived power the act behavior (Russell & William, 2007). The framework of theory of planned behavior was used in this study to reveal the relationship between game playing intention and other factors, such as, attitudes, subjective norm, behavioral control, and parenting style.

Research Hypotheses

In order to explore the relationships between behavioral intentions, contingencies of self-worth, and parenting style; five major hypotheses were proposed to guide this research.

H1: Self-worth will correlate with behavioral intention.
H2: Behavioral control will correlate with behavioral intention.
H3: Perceived attitude toward the behavior will correlate with behavioral intention.
H4: Subjective norm will correlate with behavioral intention.
H5: Parenting style will correlate with behavioral intention.

'To do or not to do' Moral Game Design

Lucas (2000b) indicated that applying complexity thinking to the world around us not only providing a difficulty to us but also giving us many new ways to think about questions and answers to the question, therefore, the hypothetic- deductive- evaluative model (Lucas, 2000a), the consequences-based normative moral problem solving technique (Hooker, 1996; Lucas, 2000a) is utilized for the game design (i.e. What happen-What you choose to do-What will happen next-What you will do next). This educational, interactive game 'To do or not to do' encourage players to consider what else would happen, what you should do, after you do what will happen, and what you will do next and so on. According to Allen (2003), hypothetico-deductivism postulates a theory of the phenomena in question in terms of a set of rules or postulates for obtaining theories, facts are not always observable, but rather by vision, accident or theories. Giving the same picture to two people, may get two different results. Furthermore, the evaluation system created in this game implies the behavior must be correct if the scores are to accord with the moral stages of Kohlberg (1984), otherwise, choice will be changed in next play.

The Model of Decision-Making Incorporating Ethical Values (Fritzsche, 1991) is the first to consider personal values as underlying "precedent of ethical behavior". There are three important parts involving game design. First of all, we consider the model of decision-making behind ethic concept and why we should include values in Part 1 of game designing. By looking at what we actually mean by objectivity, and relate this to the subjective mind that creates such a concept, we develop reductive thinking using appropriate concepts to then show that ultimately 'ought' becomes appropriate, allowing players to solve the problem based on normative concepts. In Part 2, we examine what we mean by game scoring and look at what we must do to incorporate the values of Part 1 into the moral game. We outline the hypothetic-deductive-evaluative model (i.e. what happen – what you will do – after you do what will happen- what you will do next after that happen, and so on.) which brings the integrating ideas of complexity thinking into play

in order to clarify moral value based upon meta-cognition. Lastly, in Part 3, we consider how we can use a game to make social choices in different situations, and allow us to regard conflicting values and contextual variation within a level of cognitive development.

When considering game scenario design, the problem solving model focused exclusively upon morality by Rest (1986) was adapted. Therefore, four psychological processes must occur prior to moral behavior: (1) interpret situation and create alternative actions; (2) choose alternative based upon considerations; (3) prioritize the moral vale choice above amoral values and associate choice; and (4) intend to act. The game develop the moral reasoning ability by choosing the right 'ought' to the fulfillment of these needs and desires within a self-directing self. This game is free to make the choice from many alternatives while the self is restricted by concerns with inflicting harm on himself or herself, or other individuals, interfering on their rights. Through a developmental lens, we could gain insight into some common patterns for how children and adolescents develop morally, and into issues of relevance for how children and adolescents define morality as well

To explore whether moral reasoning develops in a predictable sequence, Kohlberg (1981, 1984) provided 'hypothetical dilemma' that often put the value of life against the value of one' life to participants who were involving in his research. Kohlberg concluded that moral reasoning occurs in a sequence of three levels in which each level contained two stages. Kohlberg believed that every child started out at the pre-conventional level in terms of ego-centered considerations. The child focused on avoidance of punishment and obtainment of rewards (Stage 1) and then on satisfaction of self-interests (Stage 2). Then, the child go to group-centered considerations which the norms of family and other groups to which one belongs was focused (Stage 3), and social order was maintained (Stage 4). The third level, post-conventional level, goes beyond both the self and one's society, the emphasis is on democratic procedure and social utility (Stage 5) or universal principles and individual rights (Stage 6).

Method

This study was conducted using a survey research design. The first step of the study design procedure was to develop a set of survey questions regarding self-worth, parenting style, and theory of planned behavior based on the review of document and literature. Second, the initial questionnaire was given to an expert panel to evaluate. Third, the revised pre-test questionnaire was given to the study sample before starting the game. Fourth, the post-test questionnaire was given to participants immediately after the game. Finally, Partial Least Squares (PLS) was used to measure the path relations of hypotheses.

Participants and settings

This study was conducted in four elementary schools in Taipei, Taiwan. The target population was made up of elementary students. The selection process in this study was a challenge, thus, a convenient sampling was used in this study. A total of one hundred and twelve 5th and 6th grade students (60 males and 52 females) from four elementary schools were invited to involve in this study. Their ages were around 10 to 12 years old; they have never played "To do or not to do" before; and most of them knew how to use computer. Each child was assigned a computer for playing the game.

Instrumentations

To develop an appropriate self-report instrument, the questionnaire of this study was derived from literature review, existing document, and other existing questionnaires by other researchers, such as Baumrind (1967), Crocker and Knight (2005), Crocker, Luhtanen, Cooper, and Bouvrett (2003), Lamborn, Mounts, Steinberg, and Dornbusch (1991), Sessa (1992), and Ajzen (1991).

1. Self-worth inventory

The first instrumentation of the questionnaire was a 13-item self-report inventory adapted from the studies of Crocker and Knight (2005), and Crocker et al. (2003). Participants were asked to rate the extent to which they strongly agree or strongly disagree with each item pertaining to beliefs regarding positive self-worth, and negative self-worth, by selecting one of five points on a Likert scale. This five-point scale read 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Positive self-worth questions listed in the questionnaire, such as, Item 1 (When I feel I am attractive, I feel good about myself), Item 2 (Whenever I follow my moral values, self-satisfaction will be increased), and Item 3 (Knowing my academic performance is better than others, I feel good about myself). Negative self-worth questions, such as, Item 4 (Doing something wrong, I feel ashamed), Item 5 (If I can't follow

moral values, I could not respect myself), and Item 6 (If my academic performance is not good as expected, I feel bad about myself).

2. Parenting style inventory

The second instrument, adapted from the study done by Lamborn et al. (1991), and Sessa (1992), was a 3-item self-report measure. Students volunteers were asked to rate their beliefs associated with parenting style. Items are self-rated on a five-point Likert scale where 1 representive strongly restrict, and 5=strongly open.

Parenting style questions were related to parents' attitude toward buying snacks (Item 14), and attitudes toward helping others voluntarily but causing me in a misunderstanding (Item 15), and attitudes toward caring about others but causing me in a misunderstanding (Item 16).

3. Theory of planned behavior inventory

The third inventory, in the post-post survey, was adapted from the study done by Ajzen (1991). It contained 5 items regarding perceived attitudes toward the behavior, 3 items regarding subjective norm, 3 items regarding behavioral control, and 4 items regarding behavioral intention. Participants were asked to rate these items on a 5-point scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Item examples regarding the theory of planned behavior are provided as follows. Attitudes toward the behavior questions, such as, playing 'To do or not to do' make me feel happy. Subjective norm questions, such as, I play 'To do or not to do' because teacher's request. Behavioral intention questions, such as, I will skip my dinner for playing 'To do or not to do' at home. And behavioral intention questions, such as, I will play the game all the time or whenever I can when the 'To do or not to do' competition is coming.

Procedure

After providing the explanations of the purpose of the study and the instructions of the 'To do or not to do' game to the participants, the volunteer student participants completed the self-report pre-test questionnaire regarding self-worth and parenting style before playing the game. All participants were invited to complete the post-test questionnaire associated with the theory of planned behavior such as attitude toward the game, subjective norm, and behavioral intention after playing the game.

Data Analyses

Measurement model

We expected that each component of the pre- and post-test questionnaires except for background information section would make contributions to behavioral intentions. To test this idea, a confirmatory factor analysis was performed to examine the measurement model. The Partial Least Squares (PLS) method, one of Structural Equation Modeling (SEM), was chosen because it presumes no distributional form for measured variables, nor does it posits strong requirement on large sample sizes (Chin, 1998; Chin et al., 1996; Chin et al., 2003). The sample size of 112 was pass the recommended minimum of 40 for model testing (Wixom & Watson, 2001).

Reliability and validity of the survey

To ensure the content validity of the questionnaire, an expert panel including 10 people who are experts in this field was asked to evaluate the initial questionnaire developed based upon previous studies and literature review. The final questionnaire after the evaluation of the expert panel was administrated to study sample.

Beside the evaluation of an expert panel, the reliability and validity of the survey were assessed in several ways. According to Fornell and Larcker (1981), internal consistency can be assured by examining the composite reliability of the constructs; therefore, composite reliability was examined. Furthermore, Cronbach Alpha value was measured as well. Table 1 shows the results of composite reliability and Cronbach alpha values. All composite reliability values in this study ranged from 0.810 to 0.930, surpassing the suggested threshold value of 0.7 (Nunnally, 1978; Hair et al., 1998), though the alpha value was slightly below 0.7 in parenting style section, it is very close to 0.7, and as we will see later in this article, this parenting style section had adequate factor loading (greater than 0.5), therefore, no changes were made in parenting style section. Convergent validity in this study was evaluated by checking whether the factors loadings of each item are significant and greater than 0.5 (Nunally, 1978). In this study, the factors loadings ranged from 0.51 to 0.91 indicating acceptable convergent validity.

Table 1
Results of composite reliability and Cronbach alpha values

Construct	Composite Reliability	Cronbach Alpha
Negative Self-Worth	0.84	0.78
Positive Self-Worth	0.83	0.74
Parenting style	0.81	0.65
Perceived attitude toward the behavior	0.93	0.91
Subjective Norm	0.89	0.82
Behavioral Control	0.89	0.80
Behavioral Intention	0.84	0.75

Last, to assess the discriminant validity, the square root of AVE of each construct was computed and compared with the correlation between constructs. In Table 2, all square roots of AVE were larger than the correlation coefficients between constructs, indicating that each construct was more closely related to its corresponding measurement items than to those of other constructs. This again supports the discriminant validity of the measures. In summary, the evidence showed good reliability and validity of the survey.

Table 2
Correlation Among Variables and Square Root of AVE

	Negative Self-Worth	Positive Self-Worth	Parenting	Perceived	Norm	Control	Intention
Negative Self-Worth	**0.66**						
Positive Self-Worth	0.29	**0.67**					
Parenting	-0.01	-0.01	**0.77**				
Perceived	0.05	0.10	-0.25	**0.85**			
Norm	0.05	0.11	0.27	-0.06	**0.86**		
Control	0.07	0.03	0.31	0.02	0.50	**0.85**	
Intention	0.17	0.21	0.20	0.40	0.47	0.6	**0.75**

Structural model.

The test of the hypotheses involved estimation of the structural model's path coefficients indicating the strength of the relationship between the dependent variable, independent variables, and the R-square values, which indicate the amount of variance explained by the independent variables. The study used the single-tailed t-test, and the criteria were as follows: $*p < .05$, $t > 1.66$; $**p < .01$, $t > 2.36$; $***p < .001$, $t > 3.37$. The bootstrap re-sampling procedure was used to examine the stability of the Partial Least Squares (PLS) estimates (Chin, 1998). There were 111 re-samples. The structural model analysis was presented in Figure 1. The results showed all hypotheses were supported.

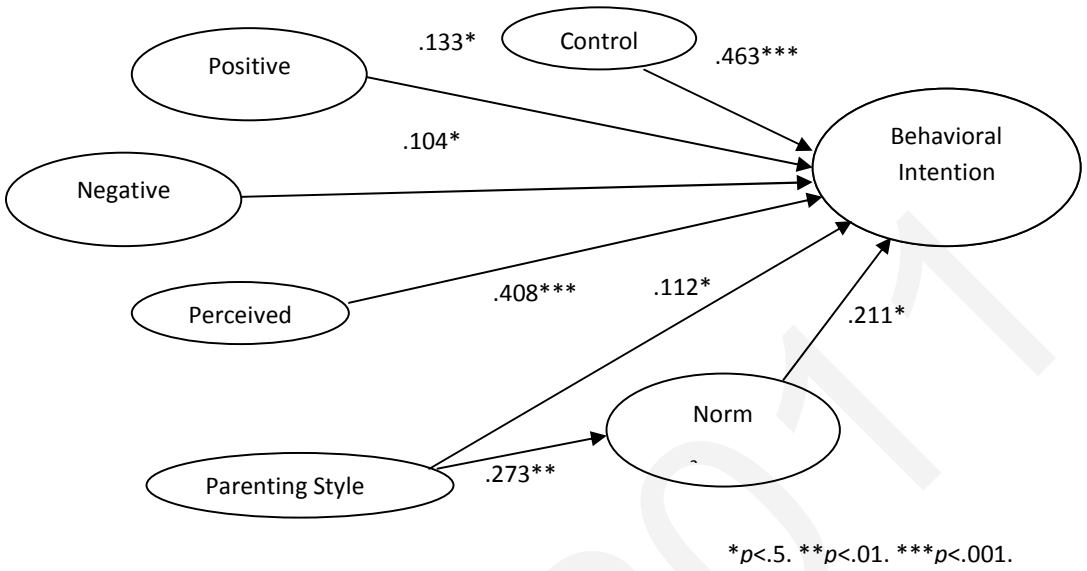

Figure 1: Structural Model Analysis

Conclusions

The present study was designed to use PLS to further investigate the relationship of behavioral intention, parenting style and the planned behavior. We had hypothesized that: (1) self-worth directly influences participants' willingness to play our game; (2) behavioral control also influences participants' willingness to play the game; (3) participants' attitudes toward playing the game positively associated with their willingness to play the game; (4) participants' subjective norm also positively associated with their willingness to play the game; and (5) participants' willingness of playing the game develop as a direct result of parenting style.

The structural model testing indicated that all hypotheses were confirmed. (1) The path direction indicated that positive self-worth positively related to children's willingness to play 'To do or not to do' (p=.13, t=2.24), and negative self-worth also related to their willingness to play the game (p=.10, t=1.71). (2) The result suggested that children's behavioral control significantly influenced playing 'To do or not to do' intention (p=.46, t=5.83). (3) Children's perceived attitudes toward playing 'To do or not to do' significantly influenced their playing intention (p=.40, t=7.18). (4) The subjective norms children possessed influenced their intention to play 'To do or not to do' (p=.21, t=2.31). (5) Parenting styles was investigated as one of factors influencing children' intention to play 'To do or not to do' (p=.11, t=1.89). Moreover, the result indicated that parenting style significantly influenced children's subjective norms (p=.27, t=3.12).

Briefly, the results indicated the self-worth, parenting style and theory of planned behavior measurements, factor loading were fit >0.5 and p values were <0.05 which fit in with research hypotheses referring to the behavioral intention was significantly influenced by behavioral control, self-worth, perceived attitude toward the game, subjective norm and parenting style. These results mirror the results of prior studies (Ajzen, 1991; Russell & William, 2007) regarding the theory of planned behavior, which reported that individual's attitude, subjective norm, and behavior control affected individual's intention. In addition, the results highlighted the importance of parenting style, which was consistent with earlier studies (Maccoby & Martin, 1983; Baumrind, 1989; 1991; 2005). Furthermore, subjective norm in this study was influenced by parenting style which in line with previous studies (Grusec, Goodnow, & Kuczynski, 2000; Lucas, 2000a) which proclaimed that children's cognitive belief structure/ways of thinking can be influence by their parents.

According to the descriptive analyses, it is exciting to find out that majority of all students rated this

game was interesting and would like to play it again. Interest has been seen as an emotion or an affective variable (Dai & Sternberg, 2004; Meyer & Turner, 2002), a powerful motivation to trigger participants to play. In this regard, the evidence of the descriptive analysis is especially revealing because it implies that interest to play the game has a positive influence on their choices to involve in the game again (Hidi & Renninger, 2006), this form of self-interest is one way to ensure that their interest will survive. Students could either play the game at home or school to learn moral education.

During the growth of moral development, people go through various different stages of moral development. Previous studies found that younger children often use the concepts from Stage 1 (avoidance of punishment and obtainment of rewards) and Stage 2 (satisfaction of self-interests) of moral development theory, while the concept of Stage 3 (belongings) became common among adolescence (Kohlberg, 1984; Snarey, 1985; Walker, 1989). This study was in line with the moral development theory, several evidences we saw were students were extremely excited when the demonstrations were offered to them, and eager to involve in the moral online game 'To do or not to do' which the punishments or rewards system was well-established to keep students remaining in the game.

Caution must used when interpreting the findings of the study and generalizing the results of the study due to the limitations related to internal validity. The first limitation was selection bias and sample size. Participants selected for this study from four different elementary schools in Taipei, Taiwan. Because of the limited access, the results of this study may have been influenced. In addition, participants in this study might not truly represent the populations in elementary schools. Caution must be used when generalizing the results of this research to children who did not involve in this study; however, the findings are applicable to those children involving in this study. The second limitation was the use of PLS can only test the relative path of the given causal model to the existing data set, thought the PLS results consistent with our hypotheses, longitudinal studies were encouraged. The third limitation might was instrumentation; participants may be affected by the wording or misunderstood the questions since these questions were adapted from English articles which could have influenced the results. The final limitation was the measures used in the present study largely emphasized the self-worth scales. Therefore, future studies should attempt to balance the content of each construct.

In summary, despite the shortcomings, the present study is consistent with previous work suggesting links among self-worth, parenting styles, and the planned behaviors. The next important step would be to conduct longitudinal studies to the structural model described in Figure 1.

Implications and Future study

The major implication of the study is directed toward identifying ways to improve outcomes of e-learning or digital learning for students in Taiwan. The results of this study showed that participants like to play this online moral game which implied that attitudes or changes that needs to be occurred in either school or at home, (1) policy makers should consider setting up an e-learning classrooms where students and teachers enjoy e-service in each classroom, (2) school administrators, or teachers may put more emphasis on e-learning by providing a variety of e-learning, and interactive courses to vitalize the instruction, (3) other professionals who cares about education, such as, e-learning web site designer, could construct a variety of e-learning platforms to attract students.

This study is unique in that it is the first to explore whether factors, such as, self-worth, parenting style and planned behavior, influence children's intention to play online moral game called 'To do or not to do' which created by digital game-based learning lab of National Taiwan Normal University, Taiwan. Thus, the online moral game itself is unique and may be useful to future researchers interested in a deeper understanding regarding e-learning issues. For example, the result did not tell us whether children's game-based online learning experiences positively affect their outcome of academic regarding moral values or not. Thus much more research is needed in comparing the moral value learning outcome between face-to-face classroom and the online educational game, especially using 'To do or not to do'.

The research approach used a quantitative research design. Interviewing a large pool of students or parents in a reasonable time frame would have proved difficult. Gathering a large data from parents regarding their parenting style would allow more in-depth analysis. Furthermore, gathering data from teachers who had used the 'To do or not to do' game in teaching moral education might be helpful to improve the study or the game we developed. Due to time restriction, and limited access, further research is needed to involve in

different phases of students, and compare the similarities and differences on the planned behavior in either 'To do or not to do' game or other e-learning games, not only in Taipei, but in other counties of Taiwan. Improvements can be made to improve this research and hopes are that educators who work in e-learning area will consider this research for future study.

The researcher offers the following examples for future study: (1) Refine the survey instruments to identify new variables which might strengthen the analysis; (2) Broaden the scope of the research to different cities or counties to enhance understanding the influences that shape students' decisions; (3) This study was limited to the scope of 5th and 6th students. It should be broaden to include multiple grade students in the study to gather a large pool of data for analysis; (4) Include teachers and parents in the study might be helpful to gather valuable data for analyses; (5) Research other influential factors such as student achievement. This would broaden the understanding the role of the game.

Acknowledgement

We give very high appreciation to the sponsor for this research from National Science Council (NSC 99-2631-S-003-003 and NSC 99-2631-S-003-013-CC2)

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Effectiveness of Automated Chinese Sentence Scoring with LSA

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ABSTRACT

Automated scoring by means of Latent Semantic Analysis (LSA) has been introduced lately to improve the traditional human scoring system. The purposes of the present study were to develop a LSA-based assessment system to evaluate children's Chinese sentence construction skills and to examine the effectiveness of LSA-based automated scoring function by comparing it with traditional human scoring. Twenty-seven fourth graders and thirty-one six graders were administered with a single-character sentence making test (subtest 1) and a two-character words sentence making test (subtest 2). The performances of LSA-based automated scoring methods in three Chinese semantic spaces generated from three type weighting functions were compared to the traditional human scoring. The results showed that LSA-based automated scoring in three different Chinese semantic spaces and traditional human scoring were highly correlated in single-character sentence making test and moderately correlated in two-character words sentence making test. The Chinese semantic space generated from Log-IDF outperformed the other two types of weighting function in the present study.

Keywords**:** Latent Semantic Analysis, LSA-based assessment system, Chinese, sentence construction

INTRODUCTION

Writing skills are important for children's overall attainment. It is probably one of the few skills we learned in school that will be used often later in life. Writing is an essential element of children's education which has an impact on the progress of children achievement across the whole curriculum. At school, children learn all the subjects by completing assigned tasks (ex., worksheets, exams, homework, essays, etc.). Writing is a means of communication; it allows children to participate actively in learning by sharing ideas, experience, thoughts, and feelings (Huang, Liu, & Hsiao, 2008). Effective writing, which requires writing with clarity, coherence, organization, and accurate grammar, is difficult to achieve, since it involves complex physical and mental processes. One important aspect that is fundamental in learning to write is constructing complete and grammatically correct sentences (Saddler, 2005). However, many children encounter challenges creating well constructed sentences.

Sentence construction can be as difficult a skill to assess as it is to learn. Reliable assessment requires a

set of well-developed criteria and a significant amount of time devoted to the scoring procedure. The present study was aiming at developing an automated scoring system with Latent Semantic Analysis (LSA) to assess children's Chinese sentence construction skills. The system was designed as a pedagogical tool to provide instant computer-generated scores for sentence construction and to reduce the heavy load in the scoring process.

Latent Semantic Analysis (LSA) is a theory and method for extracting and representing the contextual-usage meaning of words by statistical computations applied to a large corpus of text (Landauer & Dumais, 1997). It is closely related to neural net models, but is based on singular value decomposition (SVD) (Landauer, Foltz, and Laham, 1998). LSA as currently practiced has some limitations, such as it made no use of word order, thus of syntactic relations or logic, or of morphology (Landauer et al., 1998). So far, few studies applied LSA in educational purposes, but not yet in the replacement of traditional human scoring of sentences. To develop an automated scoring system with Latent Semantic Analysis (LSA), the present study used three type weighting functions (Log-Entropy, Log-IDF, TF-IDF) to establish three semantic spaces. The effectiveness of LSA-based automated scoring system was reported by comparing the correlations between the human scoring and LSA-based automated scoring.

LATENT SEMANTIC ANALYSIS

The first step using LSA to establish a semantic space is to represent the type-by-document matrix in a given corpus in which each row stands for unique type and each column stands for a document. Each cell contains the frequency with which the type of its row appeared in the passage denoted by its column. The type-by-document matrix is often transformed to weight them by their estimated importance in order to better mimic the human comprehension process (Landauer et al., 1998).

Next, LSA applied SVD and dimension reduction to the type-by-document matrix. SVD is the method used by LSA to decompose the type-by-document input matrix **A**. The SVD for $m \times n$ type-by document input matrix **A** with the rank of **A**=r is defined as follows:

$$A = U \sum V^T \qquad \text{Equation 1}$$

Where U is an orthogonal matrix, V is an orthogonal matrix, and Σ is a diagonal matrix with the remaining matrix cells all zeros (Golub & van Loan, 1989). Next, it used dimension reduction to remove the extraneous information and variability in type and document vectors which referred to as "noise". A pictorial representation of the SVD of input matrix **A** and the best rank-k approximation to **A** can be seen in Figure 1 (Berry, Dumais, & O'Brien, 1995).

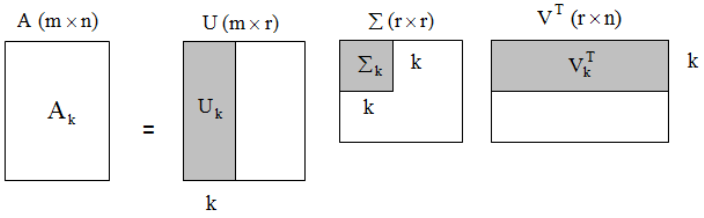

Figure 1. Diagram of the truncated SVD

After the SVD and dimension reduction, A_k is the k-dimensional vector space and called "semantic space".

METHOD

Participants

Participants were 27 fourth graders (G4) and 31 six graders (G6) at Sin-Yi elementary school in Taichung, Taiwan. The mean age of the participants was 10.8 years (range 9.3 to 12.2, SD =1.03).

Sentence Making Subtest 1

Subtest1 was a single-character sentence making test. There were two practice trials and 10 test trials. In each trial, Chinese single characters were distributed in a raw in random order. Participants were required to rearrange the characters to construct a complete and grammatical correct sentence.

Figure2 Interface of the single-character sentence making test Instruction

Sentence Making Subtest 2

Subtest 2 was a two-character words sentence making test. There were two practice trials and 10 test trials. In each trial, Chinese two- character words were distributed in a raw in random orders. Participants were required to rearrange the words to construct a complete and grammatical correct sentence.

Figure3 Interface of the two-character words sentence making test Instruction

Chinese corpus

The study used Academia Sinica Balanced Corpus of Modern Chinese (3.1) from Academia Sinica. The corpus contained 5 million words and 9227 documents. Academia Sinica Balanced Corpus of Modern Chinese was used to establish Chinese semantic space by LSA.

Type weighting function

A weighting function is generally applied to each nonzero (type frequency for type i in document j) element, a_{ij}, of the matrix **A** to improve retrieval performance (Berry & Browne, 2005; Dumais, 1991). LSA applies both a local and global weighting function to each nonzero element, a_{ij}, in order to increase or decrease the importance of types within documents (local) and across the entire document collection (global). So a_{ij} = local(i, j)*global(i), where local(i, j) is the local weighting for type i in document j, and global (i) is the type's global weighting (Dumais, 1991; Letsche & Berry, 1997). The study used three different type weighting functions: Log-Entropy, Log-IDF, TF-IDF, and the equations as follows:

$$\begin{cases} L(i,j) = \log(tf_{ij} + 1) \\ G(i) = 1 + \sum_{j} \frac{p_{ij} \log_2(p_{ij})}{\log_2 n}, p_{ij} = \frac{tf_{ij}}{gf_i} \end{cases} \quad \text{Equation 2}$$

Where Equation 2 was type weighting function of Log-Entropy, $L(i, j)$ represented local weighting. tf_{ij} was type frequency of type i in document j. $G(i)$ represented global weighting, and gf_i was the total number of times that type i appears in the entire collection of n documents.

$$\begin{cases} L(i,j) = \log(tf_{ij} + 1) \\ G(i) = \log(m / df(i)) \end{cases} \quad \text{Equation 3}$$

The Equation 3 was type weighting function of Log-IDF, where m was the total number of documents and $df(i)$ was used for the document frequency. And the Equation 4 represented the type weighting function of TF-IDF as follows:

$$\begin{cases} L(i,j) = \frac{n_{i,j}}{\sum_{k}^{N} n_{k,j}} \\ G(i) = \log(m / df(i)) \end{cases} \quad \text{Equation 4}$$

where $n_{i,j}$ is the number of times the type i occurs in the given document j and $n_{k,j}$ is the total number of types in the document, thereby normalizing the type count by document length.

LSA-based automated scoring

The ability to add new types and documents to reduced rank type-document vector space is important because the original information in the document collection oftentimes needs to be augmented for different contextual or conceptual usages (Martin & Berry, 2007). In this study, the simple way of handling the addition of sentences was used. To measure the similarity between the best answer and each participant's answer, the "fold-in" procedure was based on the existing type-document vector space. A

new sentence folded into the existing k-dimensional vector space. The Equation 5 as follows (Berry et al., 1995):

$$d_{new} = d^T U_k \Sigma_k^{-1} \quad \text{Equation 5}$$

The vector d, representing the best answer or participants' answer, contains zero and nonzero elements where the nonzero elements correspond to the type frequencies contained in the sentence adjusted by term weighting function. The similarity is computed as the cosine of the vector representation of the sentences as follows:

$$sim(S_1, S_2) = \frac{d_1 d_2^T}{\|d_1\|\|d_2\|} \quad \text{Equation 6}$$

Where d_1 is the vector representation of the best answer, S_1, which in the semantic space, and d_2 is the vector representation of the participant's answer, S_2, which in the semantic space. LSA-based automated scoring as follows:

$$score_{item} = sim(S_1, S_2) * s_{item} \quad \text{Equation 7}$$

s is maximum score in each item, and *score* represented the participant's sentence construction score in each item.

RESULTS

Pearson correlations between the human scoring and LSA-based automated scoring were calculated to examine the effectiveness of LSA-based automated scoring. The study used three different weighting functions and presented the results separately in Table 1, Table 2, and Table 3.

Table 1 Correlation between the human scoring and LSA-based automated scoring (Log-Entropy)

Variable	1	2	3	4
1 human scoring(subtest 1)	1	—	—	—
2 LSA-based automated scoring (subtest 1)	0.912**	1	—	—
3 human scoring(subest2)	0.710**	0.611**	1	—
4 LSA-based automated scoring (subtest 2)	0.511**	0.522**	0.531**	1

*p<0.05;**p<0.01

Table 2 Correlation between the human scoring and LSA-based automated scoring (Log-IDF)

Variable	1	2	3	4
1 human scoring(subtest 1)	1	—	—	—
2 LSA-based automated scoring (subtest 1)	0.916**	1	—	—
3 human scoring(subest2)	0.710**	0.617**	1	—
4 LSA-based automated scoring (subtest 2)	0.508**	0.524**	0.543**	1

*p<0.05;**p<0.01

Table 3 Correlation between the human scoring and LSA-based automated scoring (TF-IDF)

Variable	1	2	3	4
1 human scoring(subtest 1)	1	—	—	—
2 LSA-based automated scoring (subtest 1)	0.901**	1	—	—
3 human scoring(subest2)	0.710**	0.594**	1	—
4 LSA-based automated scoring (subtest 2)	0.489**	0.487**	0.467**	1

*p<0.05;**p<0.01

The results showed that the correlation between the human scoring and LSA-based automated scoring in subtest 1 was strongly correlated (r = 0.912, 0.916, 0.901). It was moderately correlated between the human scoring and LSA-based automated scoring in subtest 2 (r = 0.531, 0.543, 0.467). In the subtest 1, the relations between LSA-based automated scoring and human scoring were more consistent. To compare the performance of the three types of weighting function, the results showed that Log-IDF outperformed the other two types of weighting function (Log-Entropy and TF-IDF).

CONCLUSION

The present study developed the LSA-based assessment system and examined the effectiveness of LSA-based automated scoring function by comparing it with traditional human scoring. The results showed that LSA-based automated scoring and human scoring were highly correlated in subtest 1 (single-character sentence making test), which implies that LSA-based automated scoring was consistent with human scoring. In subtest 2 (two-character words sentence making test), LSA-based automated scoring and human scoring were moderately correlated. It was interesting to discover that LSA-based automated scoring system acted similar to human raters in single-character sentence making test (subtest 1) but not as well to two-character words sentence making test (subtest 2). One possible explanation is that LSA automated scoring system rated children's answers by comparing it with the pre-set best answers. In subtest 2 (two-character words sentence making test), the rearrangement of the two-character words would result in high similarities between the participants' answer and the best answers provided by the automated scoring system. In Chinese, each character is a morpheme, and morphemes are combined into words. The ability to manipulate and to be aware of morphemes (characters) is important for Chinese literacy acquisition. In LSA Chinese scoring system, when a sentence (or a row of characters) is given, the system will automatically segment the row of characters into words that match the corpus (e.g. 藍藍的/天空/很/美麗, *The blue sky is beautiful*). However, in subtest 2, the "two-character words" were already given in the items and therefore corresponded to the "answers" in the system. Hence, even the sentence was partially misconstructed grammatically and syntactically, a high score would be given due to the great resemblance between the responses and the pre-set best answers. Therefore, the results may be somewhat different from human raters. On contrary, in subtest 1, only single characters were given, thus, the participants were required to recognize every character; to combine characters into words; and to construct these words into meaningful and correct sentences. These behaviors require in subtest 1 actually

bear a resemblance to the actually writing activity. Above and beyond the limitations of LSA, the present automated scoring system captured both children's morphological and sentence construction skills in single-character sentence making test. In summary, LSA-based automated scoring system is effective in assessing children's sentence construction skills and that Chinese semantic space generated from Log-IDF is superior compare to the other two types of weighting function in the present study.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the support of this study by the National Science Council of Taiwan, under the Grant No. NSC-100-2420-H-142-001-MY3. The study also thank The Association for Computational Linguistics and Chinese Language Processing (ACLCLP) and The CKIP (Chinese Knowledge and Information Processing).

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EFFECTIVENESS OF MULTIMEDIA ON CONCEPTUAUL UNDERSTANNDING ABOUT THERMODYNAMICS AT UNDERGRADUATE LEVEL

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ABSTRACT

In this study, the effects of interactive multimedia package were investigated in classroom on students' conceptual understanding of heat and thermodynamics. Two groups – one control group and one experimental group of students at first year undergraduate level were studied to determine the role of computer animations in the development of functional understanding of the concepts of thermodynamics. For this purpose, interactive multimedia package on thermodynamics is developed. Thermodynamics Concept Test was administered to test students' conceptual understanding. The difficulty index and discrimination index of the test are 0.40 and 0.44 respectively. The results of the study showed that the interactive method used for experimental group is helpful in students' achievement in thermodynamics. The results of this study strongly support the fact that multimedia assisted instructions in cooperative group learning help students confront their cognitive constraints and foster a functional understanding of physics.

Keywords: Computer-mediated communications, Improving classroom teaching, Simulations, Physics education, Thermodynamics, heat engines.

INTRODUCTION

Physics Education Researchers showed that acquiring a conceptual understanding of physics has proven to be one of the most difficult challenges faced by the students. When students enter in the physics class, they have some notions, beliefs and intuitions about how the world functions. Worldwide Physics education research (PER) have shown that students possess misleading conceptions of the nature of force and motion, which are extremely hard to overcome. These results are also observed in the areas of physics like mechanics, waves, optics, heat and thermodynamics, electricity and magnetism, and quantum mechanics [11, 12, 15]. The PER that has been done on conceptual understanding of physics and epistemologies indicates that many students lack solid conceptual understanding when taught by traditional method of instruction. They have epistemologies very different from scientists [18]. Research findings of PER showed that traditional lecture instruction is ineffective in dealing with students' misconceptions. Researchers and Physics Educators have been reported that interactive- engagement teaching methods are effective in conceptual learning of students as compared to traditional instructional method. These methods have ability to encourage students to make their understanding explicit through greater mental engagement and more extensive student–student and student–instructor interaction than does a typical traditional lecture class [6, 13].

The use of modern computer technology in physics classroom teaching environment provides wide-range of alternatives to students such as visualization of abstract concepts that will foster student understanding. These alternatives would be complementary to traditional teaching are able to develop favorable attitude, and in capturing students' interest towards learning physics [5]. Computer simulations seem to be one of the most effective in physics education because a variety of visual representations in them make concepts visible that are otherwise invisible to students [4]. Computer simulations have ability to encourage students to carry out the processes used in physics research: to question, predict, hypothesize, observe, interpret results etc. They can also motivate and cultivate students' interest in learning physics. Simulations may be used for individualized instruction by allowing students to proceed on their own pace and are able to go back to master the skills [7, 19]. Using simulations students could isolate and manipulate parameters and therefore help them to develop an understanding of the

relationships among physical concepts, variables and phenomena [17]. Computer animations offer students potential of learning when there is a need for external visualization and when the content depends on an understanding of motion [3].

The present study aims to investigate whether computer assisted instruction is more effective than traditional instruction in increasing student success in physics at undergraduate level. The topic of "Thermodynamics" was selected for instructions since it is hard to understand due to the abstract nature of the quantities such as concept of heat, equation of state and thermodynamics processes. Researchers showed that students have difficulties to understand the basic concept of heat and work, the basic concept of entropy, and thermodynamic processes. Therefore students have difficulties for understanding of first law of thermodynamics and how to apply for problem solving. The students also have difficulties how to apply P-V diagram for problem solving. Researcher found that students have misinterpretation of understanding of ideal gas laws [1, 14, 16]. The students frequently failed to differentiate the concepts of heat, temperature, work and internal energy. The students have difficulties of understanding the role of entropy in the second law of thermodynamics [10, 20].

P. Jungles' studied effect of thermodynamics simulations on conceptual understanding of engineering students. He studied the four thermodynamics programs like program for state change introduces P-V diagram, program for first law of thermodynamics, program for sterling cycle and program for Isex cycle. Only program for state change introduces P-V diagram and program for first law of thermodynamics are useful for our study. He found that students' reactions to the applets are very positive and they take more active part in the lecture. All simulations are deals with the ideal gas. He found that average score of the final examinations has been increased [8]. Anne J.Cox-et- all found that understanding of basic concept of students using physlets are easy and more interesting. The Physlets so developed help to students visualize abstract concepts and make connections between mechanics and thermodynamics. The students also developed such type of physlets. In the process, students develop a more solid conceptual understanding of thermodynamic processes in introductory physics [2].

The present study aimed to provide animations and simulations through computer assisted instructions (CAI) to students to help better understand the thermodynamics processes without entirely depending on the mathematical formulation [9]. For this purpose Interactive Thermodynamics Simulation Package (ITSP) is developed.

RESEARCH OBJECTIVES

Objectives of this study were to develop and evaluate an interactive multimedia animation package on Thermodynamics and to provide first year undergraduate students of University of Pune with an interactive means of self-learning and evaluation.

RESEARCH QUESTIONS

To obtain data on various points of conceptual understanding in Thermodynamics, following research questions were set for the study.

(1) Student's ability to interpret verbal representations in thermodynamics.
(2) Student's ability to interpret equations in thermodynamics.
(3) Student's ability to interpret diagrammatic representations.
(4) Student's response to the questions posed in different representations.

MATERIALS AND METHODS

Subjects: The subjects of this study were first year undergraduate students (aged 17 to 19) from Prof. Ramkrishna More College, Pune and Hutatma Rajguru College, Rajgurunagar, Pune affiliated to Pune University in the academic year 2009-10. The students were randomly selected for two groups, Gropu-1(N = 36) as experimental group, Group-2 (N = 36) as control group.

Instruments: For data collection, a Thermodynamic Concept Test (TCT) which is composed of 20 items of multiple choices was administered to subjects. The items in the TCT were selected from 30 items following expert's advice on the basis of level of difficulty and the indexes of defined differences. The topics covered in the TCT are laws of thermodynamics, concept of heat, equation of state, isothermal, adiabatic, isochoric processes and Heat engines. Students had to choose correct alternative for each item as well as give justification for the same. The reliability constant of the test has been determined according to Kuder-Richardson method and has been identified as 0.86.

Treatment: The traditional instruction was conducted over 15 lecture hours. The pretest was administered to 150 students at the end of traditional instruction. Students' difficulties were identified in the pretests on the basis of responses and justifications. The average difficulty index and average discrimination index of the test are 0.40 and 0.44 respectively. The instrument is moderately difficult and excellent discriminator.

After the pretest, the students were divided into two groups viz. Group-1, Group-2 on the basis of random selection. During the experiments any data related to students who did not attend all activities, has been excluded from further analysis. As a result only data of 72 students' have been included in the analysis with each group of 36 students.

In Group 1, instructors used traditional method for revision of topics. The topics were revised in five lecture hours. During the revision, instructors also solved some additional problems which included some conceptual and qualitative problems.

In Group-2, Multimedia was used as a support to traditional instructions. The topics of Thermodynamics were revised for four lecture hours using the package and blackboard. The package was projected on a screen using LCD projector in the classroom. Students were observing the animations and simultaneously prepared their notes. The control and management are performed by the teacher. After revision, subgroups, each of three students, were formed. One computer for each subgroup was provided and allowed to operate the package for three hours. Simultaneously, the Multimedia package was projected on a screen using LCD projector by the instructor. Worksheets were provided to students and asked to prepare answers for the questions provided in the worksheet. Necessary details have been explained with question-answer method and animations by the instructor. The students were given step by step instruction on how to use the package and asked to explore different parts of simulations embedded in it. In addition, they were assisted by instructor when they had any difficulties. When the instructions have been completed, a posttest has been carried out.

Multimedia Package: The Interactive multimedia package applied in experimental group has been prepared with the help of Macromedia Flash, Microsoft PowerPoint®, pictures and C programming. The content of the Thermodynamics have been organized in the presentation which is in the form of six modules viz. Concept of heat, Equation of state, Thermodynamics processes, Carnot engine, Otto engine and Diesel engine. The text content in the PowerPoint slides is static as well as dynamic. Cognitive enhancement was maintained by using animations to figures to teach concepts that were inaccessible through the textbook due to the lack of the textbook's ability to show motion. Forward and backward button facilities have been used in each slide. Flash animations and simulations have been hyperlinked at appropriate positions in each module. Multiple choice questions and quizzes have been added at the end of each module. The multiple choice questions are different than that used in TCT. In simulation, students have the opportunity to observe the change in the volume or pressure with change in temperature. It has been aimed to make sure that students develop their conceptual understanding by observing these changes. Figure 1 shows screenshot of animation on Otto engine.

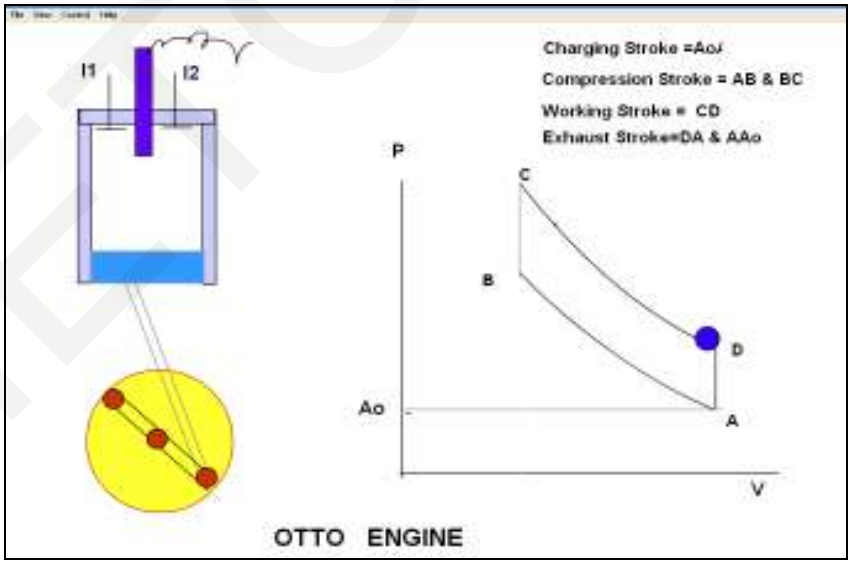

Figure 1. Screenshot of animation on Otto engine.

RESULTS

Evidence for the effectiveness of teaching aimed at producing conceptual change may be provided by initial and final assessments of students' conceptual understanding. Based on the data

obtained by TCT, the students' mean and standard deviation for pre and posttest scores for two groups were obtained. The pretest scores are presented in Table 1.

Table 1: Pretest scores of two groups

Group	N	Mean Score	Standard Deviation	t (0.01)	p	d
Group-1	36	40.26	8.15			
				0.371	0.356	0.088
Group-2	36	39.61	6.64			

The independent sample t-test was used to determine whether there was a statistically significant mean difference between two groups for the pretest at 0.01 levels. The results are presented in Table 1.

Table 1 shows t-test results of two mean scores of Group-1 and Group-2 at 0.01significance level. Effect Size (d=0.088) and critical significance level $p > 0.01$ values indicates that there is no significance difference between mean scores in the pre-test.

These results indicate that the subjects in the two groups that have participated in the research are equal in terms of knowledge according to their t-test results.

In order to investigate the effect of multimedia package approach on students' achievement on conceptual understanding about thermodynamics, a normalized gain g for each student was obtained by using the equation

$$g = \textbf{Hata!}$$

Class average normalized gain <g> with standard deviation was obtained for each group [5]. According to Hake R. (1998), the treatment given to be interactive, if <g> is greater than 0.3. To determine whether there are any differences between two groups based on the average normalized gains, the calculated gains have been subjected to t-test analysis.

The post-test scores and average normalized gains are presented in Table 2.

Table 2: Post-test findings of groups

Group	N	Mean Score	Standard Deviation	<g>	S
Group-1	36	64.29	8.96	0.404	0.113
Group-2	36	51.08	8.81	0.190	0.125

(S = standard deviation for normalized gain for g)

The results of the analysis for comparison between two groups have been provided in the Table 3.

Table 3: t-test analysis of post-test findings of Group-1 and Group-2

Group	N	<g>	S	t – value (0.01)	p	d
Group-1	36	0.404	0.113			
				7.626	4.46×10^{-11}	1.823
Group-2	36	0.190	0.125			

(S = standard deviation for normalized gain for g)

Table 3 shows t-test results of class average normalized gains of Group-1 and Group-2 at 0.01 significance level. Effect Size (1.823) and critical significance level $p < 0.01$ values indicates that there is significance difference between normalized gains in the pre-test and post-test comparison. The computer package used in support of traditional instruction helps to increase achievement in physics.

This research showed the result that Computer Assisted Instruction was pretty and much more effective than traditional teaching in students' achievement in physics.

DISCUSSION

During analysis of students' responses in pretest certain difficulties were observed in the students' conceptual understanding. Students have profound difficulties in understanding thermodynamic

processes, gas laws and heat engines. Most of the difficulties are due to students' difficulties in understanding PV diagrams and heat engines [1, 14, 16]. It is also observed that the students have poor reasoning ability.

It has been found that the Effect Size and critical significance level $p > 0.01$ values which were obtained from pretest showed the result that students in the two treatment groups have similar in terms of their knowledge.

The Effect Size and t-test obtained from class average normalized gains for group-1 and group-2 in this research showed the result that Computer Assisted Instruction was much more effective than traditional teaching in students' achievement in physics.

It is observed that computer visualization of concepts from the thermodynamics enhanced students' ability to transfer the concepts from the abstract level to the concrete level, thereby, improving their conceptual understanding of thermodynamics phenomena [2, 8]. Computer aided visualization of heat engines using computer animations helps students to understand the working of engine with variation of temperature of sink and source. It is observe that animations and simulations helped the students to understand the PV diagram, isobaric, adiabatic, and isothermal processes which may not be as observable as done inside an ordinary classroom set-up [9].

The analysis of students' responses on TCT showed that the students in Group-2 were better placed in interpretation of verbal and diagrammatic representations in thermodynamics as compared to Group-1. They are also more coherent in conceptual understanding as compared to their counter parts. Our results indicate that students significantly improved their conceptual understanding of the subject matter.

The worksheets provided to Group-2 students helped to build a coherent conceptual understanding. These worksheets acted as an instructional support to the CAI. It has been observed that CAI improves student's success as well as develops high level of thinking abilities. Students learn the concepts by comprehension rather than memorizing. The results of this study shows that teaching of "Thermodynamics" performed with animations and simulations in the scope of Computer Assisted Instruction with cooperative learning is a more productive approach than the teaching performed with traditional methods in terms of improving the student success and concept understanding.

CONCLUSIONS

In conclusion, authors have shown that computer-assisted instructions are an excellent way to focus students' understanding of principles in Thermodynamics. The use of the CAI improved the students' ability to make acceptable predictions and explanations of the phenomena in physics. Findings of this study strongly support the fact that Computer animations and simulations may be used as an alternative instructional tool, in order to help students confront their cognitive constraints and develop a functional understanding of physics. To increase effects of CAI authors strongly believe that instructional support must be provided with simulations and animations. The findings confirm that computer-assisted instructional material in physics motivates and cultivates students' interest in learning physics and they have the ability to engage students in a way that other pedagogical tools cannot. Through animations and simulations, teachers can easily demonstrate the laws, concepts, and modeling processes in physics to their students without losing his/her role as the learning guide in the classroom.

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EFFECTS OF A VIDEO GAME-BASED INTERVENTION ON BALANCE LEARNING FOR INSTITUTION-DWELLING ELDERLY IN VETERANS HOME

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ABSTRACT

The aim of this paper was to explore the outcomes of a video game-based intervention, WiiFit sport video games, on balance learning for elderly. Using a mixed-methods design, 58 participants were recruited to complete pre-/post-testing courses in the Biodex body balance (BBS) system and were divided into two experimental groups and a control group. Twenty-three participants voluntarily completed 60-minute WiiFit sport video games 3 times per week for a total of 8 weeks. Nonparametric statistical methods and constant comparison was utilized to analyze with the SPSS 15.0 and QSR Nvivo 7. Significant improvements were found in postural stability and limits of stability after the intervention ($p<.05$). The results also identified key factors to attract their participation. The results conclude that using video game-based interventions is a valuable and viable approach to encourage regular exercise participation and to improve balance learning for institution-dwelling veterans.

Keywords: postural balance, older adults, technology, WiiFit, physical education

INTRODUCTION

Falls has been the most significant serious problems and the leading cause of accidental death among older adults over the age of 65 years (Hornbrook, Stevens, Wingfield, Hollis, Greenlick, & Ory, 1994: Nelson & Amin, 1990). In addition to increasing medical costs, nonfatal falls also decrease the quality of life dramatically by causing physical injury, reducing ability of mobility, loss of confidence and sense of control, and blocking of social interaction (Tinetti, Baker, McAvay, Claus, Garrett, Gottschalk, Koch , Trainor, & Horwitz, 1994). Therefore, postural control/stability interventions have been called for to counter the progression of impaired balance in fall prevention programs for older adults and are recommended to provide movement activities that mimic movements in daily life such as twisting, turning, sudden starts and stops, standing over unstable surfaces, walking while changing speed and direction, using narrow paths, overcoming obstacles (Swanenburg, de Bruin, Uebelhart, & Mulder, 2009). Biodex Balance System (BBS; Biodex Inc.) is a laboratory-based training equipment with a multi-axial device and a circular platform that objectively measures and records an individual's balance. It provides standardized

test protocols (e.g., fall risk screening, weight-bearing assessment) and multiple training programs (e.g, fall prevention, conditioning) to improve balance for elderly (Karimi, Ebrahimi, Kahrizi, & Torkaman, 2008). However, those high-technology equipments are usually costly and limited to research institutions and are thus inaccessible and unavailable for senior institutions or communities. With the advance of technology, we proposed a low cost, accessible, and easily operated video game, Nintendo WiiFit ("WiiFit"), to proxy the high-cost, laboratory-based trainings and examine its efficacy/efficiency in senior institutions. This study aims to understand effects of training under the WiiFit programs, validating by the laboratory-based measurement, BBS. Additionally, quantitative information was also collected to understand the feasibility of the intervention in senior institutions.

METHODS AND PROCEDURES

Participants

A total of 58 participants (82.4±4.1 years) voluntarily completed BBS testing courses within one week. Twenty-three of the participants (82.4±3.9 years) were willingly to be randomly assigned into two groups (yoga group and balance group) and join the 30-minute WiiFit sport video games for 3 time/wk for 8 weeks. Within each one-hour training session, 5-minute warm-up, 50- minute game training, and 5- minute cool-down were provided in the leisure-activity room in veteran home. Thirty-five age-matched veterans (82.4±4.2 years) participated as a control group in this study. Participants were requested to complete BBS post-test within 1 week after experimental groups completing the intervention.

Outcome measures

Overall stability index (OSI) and limit of stability (LOS) are two major index to evaluate the progress of the training effects by using the BBS measures in the study. OSI are overall stability is composed of medial–lateral stability index (MLSI) and anterior–posterior stability index (APSI). Previous studies have shown that BBS is reliable for evaluating dynamic postural balance in healthy subjects (Aydog, Bal, Aydog, & Cakei,2005; Arnold & Schmitz, 1998). It is a multi-axial device which equipped with a circular platform to measure anterior–posterior and medial–lateral axes simultaneously and objectively measures/records an individual's ability to stabilize the involved joint under dynamic stress (Aydog et al., 2005).

Figure 1. Snapshots of older veterans testing on Biodex body balance system

MLSI, APSI and OSI are three major indexes that represent fluctuations around a zero point established prior to testing when the platform is stable (Arnold et al., 1998). According to a previous study, the reliability of BBS measures were R =.94 (OSI), R =.95 (APSI), and R = .93 (MLSI) in an 8 trails reliability estimates and the replication of the protocol with a separate group resulted in reliability estimates of R = .92 (OSI), R = .89 (APSI), R= .93 (MLSI). Martha also identified that intraclass correlation coefficients for the LOS tests in BBS ranged from .64 to .89 (Martha, 2000).

Interventions

Eleven participants (82.9±3.9 years) were randomly assigned to the yoga group. These participants were allowed to choose training programs from 5 Wii-yoga games which included "Deep Breathing", "Warrior", "Half Moon", "Palm Tree" and "Chair" in the very beginning sessions. More yoga postural options (e.g., Spine Extension, Gate, Grounded V and etc.) were provided while the participants were familiar with the game and requested for more challenges. Twelve participants (81.9±4.0 years) who were randomly assigned in the balance group were allowed to choose training programs from 4 Wii-balance games which included "Soccer Heading", "Table Tilt", "Balance Bubble", and "Penguin Slide" in beginning sessions. More game options were also provided when participants requested for more challenges (e.g., Ski Slalom, Ski jump and Skateboard and etc.).

During the training, staff caretakers were requested to monitor their safety and physical performance. Residential physicians and nurses were also on duty in case of emergency. Participants in control group did not receive any training or intervention during the period.

Figure 2. Snapshots of older veterans playing yoga and balance games

Statistical Analysis

The Statistical Package for the Social Sciences The SPSS version 15.0, was used to analyze the data using non-parametric tests: paired (Wilcoxon signed rank test) for within-subject variation, unpaired (Mann-Whitney U test) for between-subject variation, and Kruskal-Wallis one way analysis of variance or Chi Squared test as appropriate. Results were considered statistically significant when $p < .05$.

Qualitative Information

Participation observation and informal conversation were two major qualitative research methods to collect responses and feedback as field notes during the intervention. Older adults who participated in sport video games, co-workers, and facilitators were also interviewed by primary investigators. All data were gathered and analyzed by researchers who have previous qualitative research experience and prior experience working with elderly in senior institutions. Member checking, peer debriefing and auditing are

three main procedures to enhance the trustworthiness, credibility and transferability of the study. The QSR Nvivo 7 Software Package was used to assist in coding, sorting and generating themes of the data.

RESULTS

Adherence with the Intervention

With flexible adjustment for make-up training sessions, all participants completed 24 sessions of the interventions. The overall adherence with the intervention was 100 % and a total of 552 out of a possible 552 sessions (23 participants × 8 weeks × 3 sessions per week) were completed and no one dropped out.

Balance Improvement

BBS measures OSI (MLSI & APSI) and LOS scores in pre- and post-tests to quantify balance improvement in the elderly. Statistical significant differences were found when comparing the several scores of those groups (p<.05). Control group had significant better performance in overall and multiple domains of OSI and LOS in pre-test (see table 1). After the intervention, both experimental groups performed significantly better in overall and multiple domains of OSI and LOS in post-test. Examining the effects of the intervention, both yoga and balance groups demonstrated improvements in OSI and LOS significantly.

Table 1. Comparison of BBS measures in pre- and post-test

BBS measures	Control Group (N=35)		Experimental Group (N=23)					
					Yoga Group (N=11)		Balance Group (N=12)	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
OSI	4.02(1.16)	5.71(1.29)***	5.22(1.74)	3.20(0.87)***	5.39(1.77)	3.17(0.78)**	5.06(1.79)	3.23(0.98)**
MLSI	2.62(0.97)	4.25(1.31)***	3.26(1.36)	2.34(0.61)**	3.65(1.57)	2.45(0.68)*	2.90(1.06)	2.24(0.54)*
APSI	2.41(1.03)	3.03(1.33)*	3.29(1.68)	1.70(0.88)***	3.08(1.44)	1.48(0.71)**	3.48(1.92)	1.89(1.00)**
LOS	15.86(6.58)	11.34(5.30)***	10.48(3.34)	17.87(6.23)***	9.91(3.42)	18.00(6.72)**	11.00(3.33)	17.75(6.05)**
Forward	21.14(14.66)	12.60(11.88)**	13.22(13.94)	17.74(14.36)	16.36(17.98)	18.45(13.61)	10.33(8.72)	17.08(15.58)
Backward	21.94(19.33)	16.09(11.51)	15.48(12.31)	22.09(18.55)	15.00(13.80)	15.55(10.57)	15.92(11.38)	28.08(22.47)
Right	26.09(14.00)	21.80(14.93)	24.52(18.40)	30.70(12.33)*	22.00(19.94)	30.27(13.34)	26.83(17.43)	31.08(11.92)
Left	31.11(16.23)	26.31(13.77)	21.96(12.88)	30.61(14.79)	24.82(15.61)	32.27(12.43)	19.33(9.73)	29.08(17.08)
Forward/Right	20.09(13.86)	13.17(8.83)*	16.78(13.50)	21.52(14.25)	11.91(7.35)	23.36(17.85)	21.25(16.43)	19.83(10.50)
Forward/Left	22.77(13.50)	19.89(15.98)	20.74(17.11)	25.26(9.61)	21.18(19.44)	28.73(10.01)	20.33(15.54)	22.08(8.39)
Backward/Right	21.06(13.35)	17.00(13.73)	14.13(10.73)	22.70(13.52)*	16.73(11.77)	23.45(15.33)	11.75(9.56)	22.00(12.28)
Backward/Left	18.49(9.53)	16.54(11.93)	17.83(15.49)	24.22(16.40)	15.55(10.90)	19.36(10.20)	19.92(19.02)	28.67(19.95)

*p < 0.05 ;**p < 0.01 ;***p <0 .001 in the Wilcoxon signed rank test.

OSI= Overall stability index; MLSI= Medial–lateral stability index; APSI= Anterior–posterior stability index; LOS= limit of stability; Forward, Backward, Right, Left, Forward/Right Forward/Left, Backward/Right, Backward/Left means the degrees of the specific directions of displacement from center.

Qualitative Themes

Constant comparison was utilized to analyze the qualitative information with QSR Nvivo 7. Qualitative results identified that immediate feedback, sense of competition, companionship, challenges, social interaction with their grandchild and fun are six main reasons older veterans stay involved with the Intervention. Enjoyment, social interaction and flow experience are three key areas that ensure the quality of the intervention. In addition, adding extra-workload for staff, no interest in developing technology-based intervention, difficulties in game control/operation and amotivations for learning are four challenges to overcome in order to promote video game-based programs.

DISSCUSSION

The intervention impacted significantly on OSI, MLSI, APSI, LOS with forward, right, left, forward/right, forward/left, backward/right and backward/left ($p < .05$). In addition, experimental groups, both in yoga and balance groups, have significant balance improvements in OSI (MLSI and APSI) and LOS (right, backward/right) within the groups. The findings also extended the result of past previous studies, such as the Pigford's case study, the Nitz's pilot study, the Sugerman's feasibility study and the Williams' acceptability study (Nitz et al.,2010; Williams et al.,2010; Sugarman et al.,2009; Andrews, 2010). We found that lower frequency (3 vs. 5 times per week) and longer duration (2 vs. 8 weeks) of trainings were still able to enhance balance in elderly. Echoed the Nitz and the colleagues' study, we confirmed their results with a control group design and statistically significant outcome measurements (Nitz et al.,2010). The study also advanced the Sugerman's study and excluded veterans undergoing any physical therapy or exercise programs to ascertain the contribution of the intervention (Sugarman et al.,2009). Improving Williams' acceptability study undertaken in a supervised hospital environment, the intervention was completed in their own veteran home setting and had overcame the difficulties in recruitment and a high drop-out rate in their study (Williams et al.,2010).

The study extends the empirical support that video game-based interventions, which focused on balance improvement, activity engagement and leisure enjoyment, are viable approaches in senior institutions. Evidence that comprehensive and holistic fall-prevention studies of the response to WiiFit programs with other modes of fitness and balance trainings is recommended to expand the evidence base for this new approach. In addition, fall by getting carried away with the game, possibility of undesirable movements or postures, and overuse injuries are three major safety concerns of the study. Further safety guidance and information are also suggested in further studies.

CONCLUSIONS

This study gives insight on how leisure interventions were combined with technology and physical activity to enhance middle-old older veterans' leisure participation, improve their balance performance, and finally, promote their health. The research findings showed that WiiFit programs are viable way to attract institutional older veterans to participate initially. Further individualized programs and assistance in

control and selections are needed to continue their involvement. The study implicates that enjoyment, social interaction and flow experience are keys to develop successful video game-based intervention for institutional older veterans.

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EFFICACY OF 'STOP TB CRICKET': A MOBILE PHONE GAME FOR EDUTAINMENT

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Key words: Mobile phone games, m learning, edutainment, Tuberculosis

ABSTRACT

Mobile learning solutions are effective and mobile learning content delivery is being used as an ICT based learning method for development communication and edutainment and reaching out to grassroots communities. Tuberculosis (TB) is becoming a growing concern in India and youth comprise a large share of the Tuberculosis patients. Several mobile phone games on development issues are available today. A game on tuberculosis 'Stop TB Cricket' was selected for field testing to study its efficacy as a media for edutainment for youth (male and female) living in a resettlement colony of Delhi (India). An increase in the awareness of youth about tuberculosis was found after playing the game. The game was liked by a majority of the youth. It was found to be easy to play and an innovative way of disseminating information on a serious health concern TB. The youth wanted to acquire this game in their own mobile phones and share it with their friends and family. Several suggestions were offered to improve the game and its overall gaming experience. Several topics were suggested for developing new games. The game was found to be an effective, quick, convenient and innovative media for edutainment.

Introduction

Mobile phones have changed the entire communication scenario of the World. They have become multipurpose tools which are being used for communication, education and gaming or accessing information. Development practitioners and communication experts see mobile phones as important tools in the hands of all communities for social development.

Tuberculosis (TB) is the leading cause of death from curable infectious diseases. Globally more than 1.3 million people die of the disease every year (RNTCP Status Report, 2010). In India, TB kills more adults in the most productive age group (15-54 years) than any other infectious disease. The disruption caused – to both society and economy – is incalculable. A patient of TB takes an average of three or four months to recuperate, losing that much income. The loss is disastrous for those struggling against poverty and under-development (TB India, 2006). Government of India under its TB control programme, Revised National Tuberculosis Control Programme (RNTCP), offers free treatment and medicines at various health centres and government hospitals. DOTS (Directly Observed Treatment Short Course) a strategy recommended by WHO, is the only effective means of TB treatment and is practiced in more than 180 countries (Freedomtb, 2011).

Use of ICTs in Health Management

ICTs cover a broad range of services, applications and technologies using various types of contemporary equipments and software. Modern ICT services include cellular and mobile telephone, email transfer of files from one computer to another computer and the use of the internet. The health sector stands to benefit greatly from the use of ICTs and ICT applications, for example through the more efficient delivery of healthcare services and the provision of health information to the general public. The use of ICTs in the health sector also improves the collection, storage, retrieval and transmission of individual patient information. Furthermore, given the soaring use of mobile technologies worldwide, m health (which refers to medical and public-health practices supported by mobile devices) holds huge promise for improving the delivery of health services to an increasing share of the world's population. Thus, ICTs

have the potential to contribute to more effective delivery of health services and to increase the efficiency of health systems (OECD 2001).

Edutainment
Edutainment is a blend of two words - "Education" and "Entertainment" or educational entertainment. Edutainment content assists in active form of learning, helps in increasing retention and builds skills and competence. It helps to create interesting, situational learning environments that closely reflect a learner's true working environment. Edutainment deepens understanding by introducing the elements of fun for enhancing and retaining knowledge (ZMQ, 2010).

Mobile Phones
With the geometric increase of number of devices in the world, mobile phones have a potential of delivery of sustainable learning on a massive scale. Mobile phones are much more accessible and practical tool for most people in the world. Mobile is a self-learning device and has successfully been able to reach out to the last mile - to the grass-root communities. It is the device of the future, whether it is communication, information, enterprise development, education or edutainment. As the devices are gaining strength, there is a simultaneous gain in scope (ZMQ, 2011).

Mobile Phone Gaming
Games are an exciting way to communicate and connect with a large number of people. Rich mobile games, combined with connected near distance multiplayer gaming over Bluetooth and internet using cellular networks, opens the door for totally new gaming concepts. Mobility will add a whole new dimension to innovative and creative games concepts and will provide opportunities for the games and telecom industry alike (Goggin, 2010).

E-learning
The term e-learning comprises a lot more than online learning, virtual learning, distributed learning, networked or web-based learning. As the letter “e” in e-learning stands for the word “electronic”, e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or standalone computers and other electronic devices (Dede, 2000; 1996).

M-learning
Any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse. Mobile Learning is an ideal solution today as it facilitates learning anytime-anywhere. Mobile Learning is highly effective for social learning solutions in healthcare programs, awareness programs and literacy programs like basic numeracy and basic alphabetization for the communities with lesser literacy level (ZMQ, 2010).

Stop TB Cricket- a mobile phone game
MDR-TB Partnership has come up with an innovative approach to create awareness on Tuberculosis among children through edutainment and games. **Stop TB Cricket** is a mobile phone based cricket game developed to make young people play and learn about TB anytime – anywhere. The primary aim is to create TB awareness among youth and bring a change using interactive mobile phone games (Freedomtb, 2011).
Stop TB Cricket is a game which uses cricket as a sport to deliver messages on Tuberculosis. In ‘Stop TB Cricket’ there is two teams – Safety XI and TB Germs XI. One has to bat and chase a set of score after choosing his or her team. After every shot, a dialogue box containing facts about the disease of information countering popular myths and misconceptions associated with it is displayed. When a player scores runs, information on how to prevent TB get displayed on screen. When a player loses a wicket, information on how TB is transmitted and its cure is flashed (Jha, 2011).
It has been evidenced that interactive games blended with socially relevant messages help in effective, quicker and easier understanding of the message (Khanna A, Soni J and Singh A, 2011). Digital gaming is an interactive way of engaging people and disseminating development messages.
In the light of the emerging scenario it became imperative to seek answers to the following questions:

What are the mobile phone gaming practices of youth? What types of mobile phone games are liked by them? How frequently do they play games on mobile phones? How do they acquire mobile phone games? What is their gaming experience with Stop TB Cricket? Is the game able to increase their awareness about Tuberculosis? Is there any difference is the opinion of male and female youth regarding the game? What is the opinion of the youth about edutainment games especially in mobile phones?
Assessing the efficacy of Stop TB Cricket - a mobile phone game on Tuberculosis would give feedback to development communication practitioners, programme planners and game developers. Hence the study was designed with the following objectives:

General

To study the efficacy of a mobile phone game 'Stop TB Cricket' for creating awareness on Tuberculosis amongst youth.

Specific

1) To analyze the contents of 'Stop TB Cricket' mobile phone game.
2) To find out the mobile phone gaming practices of the youth.
3) To assess awareness of the youth about Tuberculosis before and after playing the selected mobile phone game.
4) To seek the opinion of youth regarding the following aspects of 'Stop TB Cricket':
   - Instructions for playing the games
   - Ease of playing
   - Ease of understanding the messages
   - Scoring pattern and levels of the game
   - Gaming experiences
   - Entertainment value
   - Quality of graphics
5) To seek the suggestions of the youth for improving the selected game.
6) To elicit the youth's view about mobile phone games as a media for disseminating development messages.

Hypothesis:

H_O: The game Stop TB Cricket does not increase the awareness of youth about TB.
H_A: The game Stop TB Cricket increases the awareness of youth about TB.

Variables:

Dependent: Increase in the awareness of youth about Tuberculosis
Independent: Age, sex, education and occupation of the youth
Control: Mobile phone hand set used for field testing the game
Minimum score (30 runs) that a player had to make on the game before taking the Post Test for awareness

Methodology

The study was conducted in Delhi. For field testing a sample of 80 youth were selected. For content analysis a sample of 20 experts was selected. Methodology used for data collection is described below:

Feedback from the youth: For the study, the resettlement colonies of Badarpur (especially around Molarband Village) in South Delhi (near Delhi-Haryana boarder) were selected. Badarpur is a mixture of urban and rural settlements comprising of a population of 2 lakhs and has four major clusters dominated by migrants from North Indian States. The sample comprised of 80 youth (equal number of boys and girls). Data pertaining to the objective of the study was collected by using a semi structured interview schedule and an Awareness Test administered before and after playing the game. All the youth played the game on the same mobile phone. Data was subjected to quantitative and qualitative analysis. Total score for each respondent was calculated for the pre and post Awareness Test. All the data was reported in terms of frequencies, percentages and other important statistical parameters. Suitable statistical tests were applied to arrive at conclusions.

Feedback from Experts: Twenty experts from the fields of communication and extension, education, medicine and computer were selected for the content analysis of the game. An objective type of schedule containing the messages in the game was given to them. Their opinion about the relevance, accuracy, ease

of understanding the messages and suggestions for improving them were sought. Based on the feedback received messages were graded as Excellent, Good, Average, Poor and Very poor.

Major Findings

Socio Economic Profile of the youth: All the respondents were between 15-25 years and comprised of equal number of males and females. The youngest respondent was 15 years and the oldest was 25 years. The average age of the respondents was 18.65 years. It was found that 68.75% were in the age group of 15-19 years. There were about 40 (50%) males and 40 (50%) females that were included in the study.
Most of the respondents were school going. Of these 50% of the youth were 10^{th} class pass where as 37.5% were 12^{th} class pass. More boys as compared to girls were found to be class 12^{th} passed. Only 8.75% youth were graduates. No one in the sample was post graduate. A majority of the youth (85%) was students and hence a very few were employed.

Mobile phone gaming practices of youth:
Frequency of playing mobile phone games: All the respondents had played mobile phone games earlier. A large majority (81.25%) of the youth played mobile phone games occasionally. Only 7.5% of the youth reported that they played mobile phone games every day. A few youth (5%) stated that they played once a week and 6.25% played mobile phone games occasionally.
Purpose of playing mobile phone games: Most of the youth (81.25%) reported that they played mobile phone games for entertainment and pass time and the remaining played to make their mind sharp.
Age at which started playing mobile phone game: About half of the youth (50%) reported that they started playing the mobile phone game at the age of 16-20 years whereas 38.75% started playing the game at the age of 10-15 years. A few youth reported that they started playing games on mobile phones when they were less than 10 years of age.
Duration of playing mobile phone games: An average mobile phone gaming session was reported to be under 15 minutes for more than half the youth (56.25%), 33.75% played the game for about 16-30 minutes, 10% played for 31-60 minutes and the remaining youth played for 1 hour or more at a stretch. The duration of playing mobile phone games was found to be similar for both male and female youth. On statistical analysis it was found that there was no association between sex, age group and occupation of the youth with the duration of playing mobile phone games. However, a significant association was found between the level of education of the youth and duration of playing mobile phone games.
Place for playing mobile phone games: It was found that 70% of the youth preferred playing mobile phone games at their home. They also played while travelling, sitting in a park or at friend's house.
Favourite mobile phone games: The youth liked a variety of mobile phone games. The most popular type of games were sports based games (51.40%) like Cricket, Rapid roll and Football, followed by adventure games (liked by 31.7% of the youth) and Puzzles and racing games were liked by 8.5% youth significantly related to their sex.
On statistical analysis it was found that the type of game liked by the youth was found to be significantly associated with their sex. No statistically significant association was found between the type of mobile phone game liked and the youth's age, education and occupation
Choice of brand for mobile phone gaming: The most preferred brand of handset for playing mobile phone games was reported to be Nokia by 75% respondents. Other brands were Motorola, Sony Ericson, Spice, and phones by Reliance and Tata Indicom.
Price of mobile phone used: A large number of youth (63.75%) were found to be using mobile phones in the price band of Rs.1000-2000. It was found that low cost mobile phones under Rs 5000/- were used by a majority of the youth. The others were found to be using more expensive phones.
Method of acquiring mobile phone games: Only one-third of the sample was aware that mobile phone games could be loaded through internet (33.75%) or by using Bluetooth technology (16.25%). A few respondents were aware that mobile phone games can also be loaded by using a data cable and a computer. A large number (40%) were of the view that mobile phone games came preloaded from the manufacturer only. It was observed that more boys than girls were aware that new games could be loaded in mobile phones by them.
Frequency of acquiring mobile phone game: Nearly one-third (31.25%) of the youth revealed that they sometimes acquired mobile phone games. Whereas 63.75% revealed that they had never acquired a new game in their mobile phone. It was found that more boys (50%) than girls (17.5%) had tried acquiring new games in their mobile phones.

Ability to download mobile phone game: The youth were asked whether they were able to download mobile phone games and found the process of downloading easy or difficult. About half of the youth (52.5%) reported that they found the process of downloading a game difficult.
On statistical analysis it was found that the ability to load games in a mobile phone was related to the sex of the youth. No statistically significant association was found between the type of mobile phone game liked and the youth's age, education and occupation.
Advantage(s) of playing mobile phone games: About half of the youth (46.25%) stated that playing mobile phone games helped them to gain information, become mentally alert (23.75%) and sharpen their memory.
Disadvantage(s) of playing mobile phone games: The youth listed a few disadvantages of playing mobile phone games. About 42.5% of the youth felt that the major disadvantage of playing mobile phone games was wastage of time, 30% felt they could not concentrate on their studies and some believed that playing mobile phone games would weaken their eye sight.
Problems encountered while playing mobile phone games: The youth were asked to share some of the problems that encountered while playing mobile phone games. The most frequently encountered problems while gaming were reported to be low battery life (45%) and small buttons (28.75%). Other problems reported were small size of the screen, poor sound and graphics.

Feedback about Stop TB Cricket:

Figure: Stop TB Cricket- mobile phone game

Subject of the game Stop TB Cricket: Although a majority of the youth (80%) stated that the game they played was about TB. However, the remaining mentioned that the game was on cricket- of these 30% were girls and 10% were boys.
Time taken to gain proficiency in playing Stop TB Cricket: A majority of the youth (90%) took only 1-2 times to play the game and develop proficiency in it. A similar trend was observed in both boys and girls. Thus, it can be concluded that the game Stop TB Cricket was easy to understand and play.
Ease of playing the game: The game was found easy to play by a majority of the youth. About 20% of the youth found the game 'very easy' to play and 53.75% reported that it was 'easy' to play. About one-fourth of the youth (26.75%) found the game 'difficult' to play.
Ease of understanding the instructions for playing the game: Half of the youth (50%) reported that they found the instructions for playing the game 'clear' where as 23.75% reported that they were 'very clear'. Nearly one-fourth of the youth (26.25%) reported that the instructions were 'unclear'- of these girls were found to be more in number as compared to boys.
Problems encountered while playing Stop TB Cricket: A large number of the youth (65%) did not report any problem in playing the game. However, the others reported problems related to size of buttons on handset, difficulty in understanding some instructions and some messages. It was observed that more girls than boys reported problems while playing the game.
Appeal of the game: Almost all the youth (95%) found the game quite appealing in general. A large number of the youth (70%) found the game very appealing. The TB game was based on cricket which is a very popular sport in India. This was cited as the main reason for liking the game.
Language of the Messages: It was found that only about one-third (36.25%) of the respondents found the messages in the game 'very clear', 57.5% stated that they found the messages 'clear' and the few remaining found them 'unclear'. Although the game was in Hindi, the words used in some messages were found to be difficult to understand. For example, words like '*sankraman*, DOTS *pranalee*, etc. were found difficult to understand.
Efficacy of Stop TB Cricket in enhancing awareness about Tuberculosis: To assess the effectiveness of Stop TB Cricket in enhancing the youth's awareness about Tuberculosis an Awareness Test comprising of 16 objective type questions was administered to the respondents before and after playing the game.

Each question was given 1 mark. The average score on the Awareness Test before playing the game was found to be 10.75 and increased to 12.50 after playing the game. Hence, the average gain in score was 1.75. The gain in average awareness score was found to be more in female respondents (2.08) as compared to male respondents (1.80).
The lowest score before playing the game was 6 and the highest score before playing the game was 15 amongst all the youth. The lowest score after playing the game was 9 and the highest score was 16. The minimum gain in score after playing the game was 1 and maximum was 7. A few respondents (5%) did not show any change in awareness score after playing the game.
Increase in the awareness scores clearly indicated that the game Stop TB Cricket was quite effective in increasing awareness of the youth about Tuberculosis. This was also confirmed by statistical analysis.
It was concluded that awareness about TB after playing the game Stop TB Cricket was significantly higher amongst the youth. It was concluded that the game Stop TB Cricket is successful in increasing the awareness of youth about TB.
It was also concluded that increase in awareness of youth about TB was significantly correlated to the education of the youth. Variables like age group, sex and occupation were not found to have any correlation with the performance of the youth on the awareness test.
Willingness to acquire edutainment based mobile phone games: Nearly all the youth (93.75%) expressed willingness to acquire edutainment based mobile phone games in their phones as they found these games to be very informative and entertaining.
Issues suggested for making edutainment based mobile phone games: Most of the youth had a lot of suggestions to give about the kind of new mobile phone games they wanted to be developed. The youth suggested that new mobile phone games should be prepared on health (83.75%), social issues (12.5%) and environment (7.5%). They were found willing to participate in the game development process. Such initiatives could be supported by the local government, NGOs, corporate, especially mobile phone manufacturers and network service providers, and other institutions concerned with community development (as a part of their Corporate Social Responsibility strategy).
Method of sharing information about edutainment based games: All the youth expressed willingness to share information about edutainment based mobile phone games with their family and friends. They suggested a wide variety of ways by which mobile phone games with development messages could be introduced to more people in the community. These included street theatre (28.75%), internet (22.5%), sms on mobile phones (18.75%), and advertisements in newspapers (18.75%), visits in schools and homes (16.25%) and TV advertisements (12.5%). Posters/pamphlets, meetings and information stalls were suggested by very few respondents.
Suggestions for improving 'Stop TB Cricket': A lot of suggestions were offered to improve the game: 17.5% suggested that the game should have different types and levels, 16.25% wanted the content and language to be simpler, 13.75% wanted both male and female players in the game, 12.5% wanted better graphics and 10% wanted better readability in terms of larger font size and slower speed of scrolling of text.

Feedback from Experts- Analysis of messages appearing in the game:
There were the total 16 messages in the game. It was found that the game contained no message on signs and symptoms of TB. A lay person identifies a disease by seeing certain signs and symptoms. Hence it was very important to have messages creating awareness about signs and symptoms of a disease. There were 3 messages on Causes, 4 messages on Diagnosis and Treatment, 5 messages on Prevention and Myths and Misconceptions and 1 General message on Tuberculosis.
Based on feedback from experts it was concluded that out of 16 messages in the game 1 message were rated as Excellent, 9 messages were rated Good, 6 messages were rated Average, none of the messages were graded as Poor and Very Poor. The suggestions given by the experts were used to revise the messages in the game. The revised messages can be incorporated in the next edition of the game by the game developer. Content analysis of the game gave valuable insights about the choice of language and nature of messages to be included in a game on Tuberculosis for mass distribution in Hindi language.

Conclusions and Recommendations

- Youth played mobile phone games frequently primarily for entertaining themselves. The most popular type of games liked by the youth were based on sports and adventure.
- Stop TB Cricket' was liked by most of the youth. It was found to be effective in creating awareness about Tuberculosis amongst both male and female players. This was confirmed by statistical analysis.

Thus, the game can be used to disseminate messages on TB to people in a cost and time efficient manner.

- Almost all the youth wanted to have Stop TB Cricket in their mobile phones. A majority did not have internet connection activated in their phones. Therefore the game could not be loaded in their phones. Technology should be developed to make it possible to load mobile phone games through Bluetooth to reduce dependence on a live internet connection. This will make it easy to share mobile games amongst people who do not have internet activated on their phones.
- Stop TB Cricket should include male and female players to increase its appeal, especially to female gamers.
- There must be levels in the game like 20-20 or test match so that it excite more of the youth. There could be options to choose male and female players in a team, directions for bowling, sound of audience cheering whenever a player hits a 4 or 6 or gets out.
- Instructions for playing should be provided in Hindi and English.
- Mobile phone games should be developed with superior graphics, sound effects and ease of controlling to enhance the gaming experience.
- Youth suggested that new mobile phone edutainment games should be developed on issues like gender, environment, health, nutrition and on topics from their school syllabus. Developing a mobile phone costs about 5-6 lakh Rupees. Such an initiative can be supported by the local government, NGOs, corporates, especially mobile phone manufacturers and network service providers as a part of their corporate social responsibility, and other institutions associated with community development.
- Messages for Stop TB Cricket should be framed in simple spoken language so that they are easy to understand. More messages on TB can be included in Stop TB Cricket, especially on signs and symptoms and myths and misconceptions. Out of the 16 messages in the game, experts rated only 1 message as Excellent and 9 messages as Good, 6 messages were rated as Average. None of the messages were rated as Poor or Very Poor.
- Mobile phone edutainment games should be widely publicized through the mass media to inform the public about their purpose, source and method of acquiring. Gaming tournaments can be organized to create interest and awareness amongst the public about these games.
- Mobile phone edutainment games should be available for free download on all mobile network service providers to facilitate widespread dissemination of development messages to the masses.

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Elameer-Idrus Orbital e-Education Framework for the University of Mustansiriyah (UoMust)

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ABSTRACT

The study of the university of Mustansiriyah case show us very clear that university suffers from a lot of problems start from the security , technology , management , pedagogical and ethical. Based on a pre-questionnaire survey about e-learning results, interviews and studies show us the need to the complete e-education system. Continuous scrutiny and study of the Iraqi higher education showed us very clearly there was something missing and need to be more reinforced in our modified Khan framework especially with the revolution of the wireless technologies. A framework was designed with many added dimensions like stability, time, learner, content control, standardization, scalability and modularization. As a result, a new framework, is an *ELAMEER-IDRUS* orbit e-education framework with a good acceptance at the post evaluation process that was achieved from a group of 231 senior academics.

Keywords : University of Mustansiriyah (UoMust) , e-Education , Khan e-Learning framework , Modified Khan e-learning framework ,

1. INTRODUCTION

There are no doubts about the benefits of educational technologies to higher education and the impact on the learning process; in Iraq it demands for a change in the mindset of the students, lecturers, administrators of the universities, learning leaders, and the decision makers(Harb, 2008; Husain, 2004). Nowadays, the linear learning methods are obsolete and replaced by a cyclical new modern methods. Students now can start with study, go to work and come back to study again. This cyclic pattern will be the future feature of higher education, and technology will be the catalyst in realizing the flexibility, simplicity, durability, standard ability, scalability and mobility. E-learning could also easily customize the academic programs based on the demands and the geographical, culture, technological constraints of the students.

Iraqi universities are in urgent need for e-education systems and also the ministry need for the e-ministry, since the e-education are the focus on the learning and pedagogical factors. E-education can be defined as the learning process that involves e-learning with the different administrative and strategic measures needed to support the learning in an Internet environment, and it will incorporate a local, regional, national and international view of education. Most of the lecturers found them self without any instructional aides or educational technologies to use it because of lowest governmental budgets, especially in education systems with monitored increasing in the students' numbers.

Previously like all the education systems in the world the learning concept in Iraq was teacher-centered, and when the world start to change this concept and start making the learner as the core. The Iraqi education system starts to concrete the lecturer role as the core and center of the learning process. The reason for that was :

1-Difficult economic living condition in all of Iraq, missing the required concentration for the students and learner.

2-Government focusing on the quantity not quality of the graduates.

3-Learner core concept starts at the end of the eighteen decades when the Iraqi economy starts to fall down pursuant to the first gulf war.

As a result of complications and the circumstances that have passed on Iraq and the characteristics of the universities educational environment, it has been found that the adoption of any educational e-learning model or framework will not be useful for UoMust or the Iraqi universities because of the many factors that will play a big role in affecting e-education in Iraq's universities, and it was necessary to build a special e-education framework which considers all the education dimensions into consideration in Iraq to reach the best of the quality teaching.

After scrutinizing the e-learning framework from past researchers, it was found that each designer put their own ideas in the framework but most of them stated some factors that could influence an electronic learning system. Some variables in this research were selected from literature that was

reviewed and others were from interviews with experts in the field of e- learning in different science sectors. Many studies have identified important variables dealing with an electronic learning system.

2. METHODOLOGY

The ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) was utilized in the study. Our framework is a result coming from :

1-Searching for the best e-education and e-learning frameworks in the previous studies and literatures.

2- An exploratory research of the state-of-the-e-learning and e-education and their future perspectives in our research context about Iraqi higher education.

A specially formulated questionnaire was designed and distributed between a group of Iraqi Mustansiriyah University staff to investigate the direction towards the e-learning elements, management & institutional problems, which are the basic elements of the proposed strategy and that could face the implementing e-education projects, the benefits that will be gained to the higher education sector, and the technology problems.

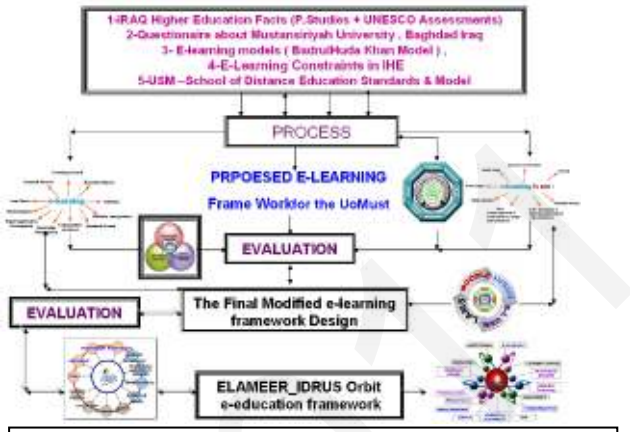

Figure.1 : The research methodology framework

3. THE INSTRUMENT

The Statistical procedure and the data analysis is one of the most important parts of the research work, and according to (Marczyk et al. 2005) "in most types of research studies. The process of data analysis involves the following three steps: (1) preparing the data for analysis, (2) analyzing the data, and (3) interpreting the data". At the preliminary stage, a survey technique was used to collect the data and prepare it for the analyzing through a questionnaire of 44 statements for the e-learning and ICT skills in the UoMust. Preparation of the data for analysis was collected from the questionnaire which was divided into two parts. The first was the general and personal information the second included the targeted questions that as divided into five categories of management, institutional, technology, human resources and general.

The questionnaire was distributed between the academicians and after completing the framework design and at the final stage a post evaluation was achieved by a questionnaire of 50 statements about the design and all its elements and components.

All the statements and feedback were analyzed and computerized using the statically package for social science (SPSS) to obtain the mean (M), standard deviation (St.D), percentages (%). A Likert scale of six points was used (Gelin 2003), and they are: strongly agree (SA)-6, agree (A)-5, neutral (N)-4, disagree (DA)-3, strongly disagree (SDA)-2, don't know-(DK)-1 ((Kaghed & Dezaye, 2009);(Mohammad, 2008)).

4. THE ORBIT FRAMEWORK:

The power and effectiveness of these new tools and methods are always being associated with the electronic learning methods, pedagogy, technology, institutionally, managerially, equity, ethically, interface designs and the way to access and any other variables could play a role in the learning process. To change this situation, we need to build a complete education system its core or center is the student or the learner since the researches and all the up to date educational theories prove that and encourage to design the learning environments centralizing the student or learner for an e-Education framework for the University of Mustansiriyah.

The Khan framework portrays a comprehensive theoretical e-learning model. E-Learning can be defined now as Badrul H. Khan stated: An innovative approach for delivering well designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime, by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open and distributed learning environment. The emergence of this frame work made the greatest impact in the revolution of e-learning that take place in the all of the learning sectors since this framework,

for the last 16 years, described all the education and learning process. Further, the framework also offered the logical base for all the e-learning instructional designers on how to design and implement effective learning environment in the e-learning process using the interactions afforded via computers and the internet, considering and stating all the factors that could affect the proposed designs. The Khan framework is still widely utilized until today.((Khan, 2004, 2009; Khan & Granato, 2007)).

And according to the results that we obtain it from a UoMust surveys and studying the Iraqi higher education status we find that the elements that to be considered in any framework design are:

1-Pedagaogical, 2-Ethical, 3-Evaluation, 4-Technological, 5-Interface Design, 6-Institutional, 7-Management, 8-Wireless Technologies, 9-Time, 10-Content Control, 11-Human Resources Capacity Building, 12-Evaluation , 13-Learner. as shown in figure .2.

The Khan framework was modified and a new e-learning framework was built for the UoMust with 12 dimensions as shown in figure .3.

The e-learning elements was divided into three main trajectories, and they are, 1- Technological, 2-Organizational, 3-Educational, and each trajectory has its own elements that related to its functionality and Characterize by its main mark.

We believe that learning is completely systematically operation because it's dealing with the humans whatever its type was, and any systematic operation needed to be stable from the beginning and starting to its final goal or end, and learning must be stable operation in all its steps or phases.

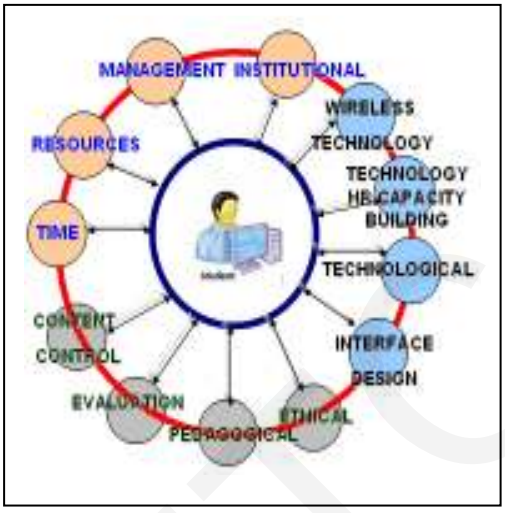

Figure.2 : All e-learning dimensions and elements

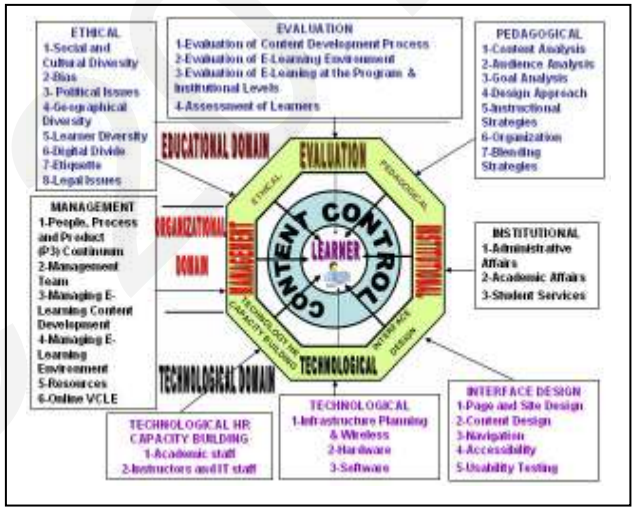

Figure.3 : Modified Khan e-learning framework

In all the investigated models, we never found any model deal with this element that could effect and destroyed all the learning process because most of the designers are backgrounds are stable and consistent. In Iraq, it is a completely different case, and nothing is stable at all and small examples for that in Iraqi higher education undergraduate studies, they invent the third trial exams for whom that fail to reach the exam's rooms in the fixed time and date.

This is in the face to face traditional learning process, and more stability is needed in an electronic learning process. From that point of stand stability become a very important element if we are designing or trying to design e-learning or e-education activities in un stable countries where everything is not stable or going to be stable in the near future, and we also believe adopting such a stable framework could push strongly towards the stability of the learning process. We believe that the technological is the base and the foundation for our framework and for that we give this trajectory the main position inside the design and build all other elements according to its up to date new technological shapes after the ICT revolution which changes all old standards and concepts. These trajectory's elements are :

4-1- Technological Trajectory: the e-learning elements here must be scalable and stable and the elements are: Technology, Wireless technology, interface design, and technological human resources capacity building.

One computer to one learner is a very difficult formula to reach in any learning institution, especially with the same specifications.((Bielefeldt, 2006). Internet speed, or bandwidth, was a crucial issue for performance in large e-education networks. Studies have shown that the introduction of high-

access computing can change the nature of instruction , and the strategies learned with technology may not be the same ones required for standard assessments of learning (Means & Olson, 1995).

"E-learning should ensure sufficient bandwidth is available to support the type of online learning applications being used and to ensure e learners have opportunities for face to face experiences in conjunction with their e-learning."(Ismail, Idrus, Ziden, & Fook, 2009).

ICT technology is the base for our framework, and it is the main trajectory that we build our system on it and without it, there is no e-education. In the Technological trajectory, we have four dimensions, and they are**:**

4-1-1-Technology: The technological dimension of e-learning examines issues of technology infrastructure in e-learning environments. This includes infrastructure planning, hardware, and software and according to that the changes in the education system in Iraq will be completely 180 degree turn, and everything will up to date and new. With considering that most emergent technologies are not widely having an adopted standard (hardware or software).

4-1-2-Human Resources Capacity Building: (MacDonald, Stodel, Hall, & Weaver, 2009) stated that if people did not have positive attitude, knowledge and skills of ICT, the e- learning program fails. Knowledge and skills have a direct impact on using e-learning. Since most of Iraqi universities suffers from the luck of required skills, (Elameer & Idrus, 2010), and we think Iraq needs to increase the believing in ICT which we think it will re shaped the education system completely.

4-1-3-Interface Design: The interface design refers to the overall look and feel of e-learning programs. The interface design dimension encompasses page and site design, content design, navigation, accessibility, and usability testing (((Khan, 2005; Rosenberg et al., 2007) and it is a very important element because it could be the way to the success, or they fail of any frame wok.

4-1-4-Wireless Technology : The growing development and application of wireless Information and Communication Technologies (WICT) opens new windows and opportunities for education improvement and redesigns the organizational and educational settings and shapes

To increase process polychromic, i.e., the possibility to deal with several tasks simultaneously. There is also a social context that includes different cultural formations, situations and moods, degrees of proximity and mutual recognition among people, etiquette and other elements that define what is or is not allowed in certain situations.

4-2- Organizational Trajectory: The e-learning elements here must be standardized according to the progressed university standardization and the elements are: Institutional, Management, Resources, and the Time. Furthermore, the organizational standard must be stable, and do not influence by the country or society changing winds only if it is to the better. The Stability of the universities is one of its basic academic characteristics, and we can find very clearly how the rules and regulations of the big names' universities like Cambridge, Oxford, UCL ,..etc. still same from long years ago and this a big indication for these universities organizational stability.

In Iraq the case is completely different and nothing is stable at all, and this comes from the changing of the regime in Iraq and missing universities stability come as a result for the country transform to the democracy.

In the Organizational trajectory, we have four dimensions, and they are:

4-2-1-Institutional: The institutional dimension is concerned with issues of administrative affairs, academic affairs, and student services related to e-learning.

4-2-2-Resources: The resource support dimension of e-learning examines the online support and resources required to foster meaningful learning

4-2-3-Management**:** The management of e-learning refers to the maintenance of the learning environment and distribution of information and lack of ongoing support from management, failure to perform meaningful reviews to ensure an environment of continuous process improvement, etc.(Idrus, 2008).

4-2-4-Time: Time is considered a very important dimension in any innovative implementation of e-learning framework with considering the differences between the student achievement capabilities and the individualized differences, but we can keep time open without any upper limits or an end.

Availability of time must be adequate time and compensated time for users to become educated and skilled in how to use an innovation. This condition refers not only to the organization's willingness to provide time (such as paid time or release time) but the users' willingness to devote learning time to use the innovation.(Idrus 2008)

4-3-Educational Trajectory: The e-learning elements here must be modularized according to the Iraqi student's characteristics, and the elements are: Pedagogical, Evaluation, Ethical and the Content control.

In IT and in general Modularity definition is the property of the software (computer programs) that measures the extent to which programs or software have been composed out of separate parts called modules.

Modularity in learning is the same concept, and it is defined as the property of allowing to encapsulate, expose and separately reuse parts of a learning resource.

The framework has been designed to modularized the digital learning content, and it has been addressed as a part of the concept of learning objects.

The framework presented in this research can be used as the basis for a good foundation for modularization of the VLE. By modularizing the VLE, new functional components can be easily added in a way that makes them work as an integrated part of the overall learning environment.(Paulsson & Berglund, 2006).

In the Educational trajectory, we have four dimensions and as a word of the truth Khan 2009 framework had covered three dimensions completely, and we cannot find any missing element in his work in the field of pedagogical, ethical and evaluation as educational dimensions, but we also believe that content control should be added here as a new dimension to the educational trajectory.

With any technology, the effects on teaching and learning to depend on integration with curriculum and instruction (Bielefeldt, 2006)

4-3-1-Pedagogical: The pedagogical dimension of e-learning refers to teach and learning. This dimension addresses issues concerning content analysis, audience analysis, goal analysis, media analysis; design Approach, organization, and learning strategies.

4-3-2-Ethical: The ethical considerations of e-learning relate to social and political influence, cultural diversity, bias, geographical diversity, learner diversity, the digital divide, etiquette, and legal issues.

4-3-3-Evaluation: The evaluation of e-learning includes both the assessment of learners and the evaluation of the instruction and learning environment.

4-3-4-Content Control: The central ideology of learning theories is that learning occurs inside a person. Learning theories are concerned with the actual process of learning, not with the value of what is being learned.

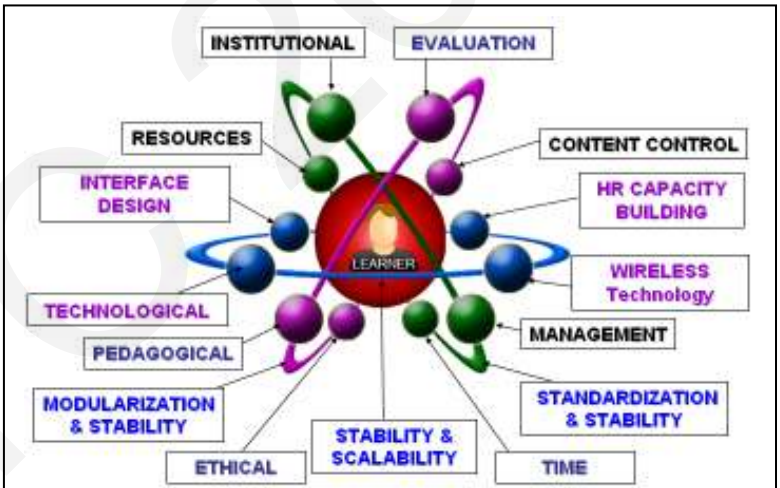

Figure.4 : ELAMEER-IDRUS e-Education Framework

In general content must be cooperative, collaborative and each learner has a learning path that caters for learners learning needs and interests in a productive. Students learn in differing ways and the manner in which information is presented to them affects their ability to learn (Kahiigi, Ekenberg, Hansson, Tusubira, & Danielson, 2008). Students need to utilize the different learning styles interchangeably during the learning process in order for them to have an effective learning experience.

"Technology-enhanced student-centered learning environments organize interrelated learning themes into meaningful contexts"(Muniandy, Mohamad, Fook, & Idrus, 2009).

In order to achieve that (Moodle 1999) can help us and it are developed to facilitate the collaborative creation of content, organization, control and to manage the publication of documents in a centralized learner learning environment.As a final result the e-Learning context, advancement in network technologies, e-Learning technologies, and content development has facilitated multiple content presentations, personalization and ubiquitous learning. After studying each element and its direct effect to the student in the e-learning process, the framework was akin to the mechanics of orbital motion of the electrons that is moving in circular orbits at the constant speed around a nucleus, and when we finally understand the electron movement, we discover that each electron actually moves in a "wave pattern" where bodies (learning elements) with a slight difference en masse orbiting around a common barycentric (student as the core of the learning process). As such, the framework was reshaped into an orbit shape with the three trajectories and the design as orbital e- education framework.

5.ADVANTAGES OF ELAMEER-IDRUS ORBITAL E- EDUCATION FRAMEWORK

The instructionally designed orbital e-Education framework that will be used to digitize education activities and comprehensively covers all the education dimensions in UoMust is presented in Figure .4 with all the dimensions and sub-dimensions details. It has the following advantages:

1- The first framework that pays great attention to capacity building and ensuring well training for productive application

2- The first framework to study time. In the new world, time is money and in education we cannot keep it open freely without any control.

3- The first framework to study the up-to-date wireless technologies and their great benefits to the learning process. It is also the first to identify technology as a factor that can influence learning process or even end it.

4- The first framework to take modularization into consideration.

5- The framework could be useful and applied in any e-learning process, because we have taken into consideration the factors of M-learning, B-Learning and U-learning.

6- The first framework to take scalability into consideration.

7- The first framework to take standardization into consideration.

8- The first framework to take stability into consideration.

6.THE POST-EVALUATION RESULTS

The results of the post evaluation for the new orbit model come in the highly positive side and (87%) of the academic staff welcomed the e-education orbit framework and encourage widely to adopt it and use it and (72 %) believe that it covers a lot of the e-learning area and then using of this framework in the higher education come in the accepted zone with (69%). The good technological area in the orbit framework was completely in the positive side (excellent) and (92%) welcomed the strong technological domain in the framework. The solution of missing communications infrastructures by the wireless up to date technologies in the technological domain was very good grade (87%) and was welcomed . The managerial domain and its developed come in the accepted grade range (65%) and also the same for educational domain (67%). Human resources capacity building was also welcomed and come with (83%) in the zone of the very good grade and (75%) want the focusing of the HRCB to be on the senior academic staff. Furthermore, the VCLE was one of the e-learning component and (87%) welcomed adopting e-learning in UoMust need for a good video conference learning environment.

Distance education still away from the Iraqi higher education because of the luck information about it and its great benefits and the thinking about to certified distance education is come only with (65%) in the grade of accepted only and also the new mobile learning technologies are still also a way (60%) and in accepted grade and this result was completely known to us since the mobile technology is still at its first steps and mobile using was just allowed in 2004. The result obtained from the post evaluation are shown in table.1.

Table . 1 : Some of the result obtain from the post evaluation

Excellent 90-100	Very Good 80-89	Good 70-79	Accepted 60-69			Poor 50-59			Very Poor Less than 50	
Statement			SA	A	N	DA	SDA	N	MEAN	%
UoMust need for a complete e- higher education system as the proposed			117	72	21	10	6	5	5.146	86
E-learning in UoMust need for a good MIS (Management information system)			89	95	5	13	4	25	4.766	79.43
Adopting e-learning in UoMust need for a good framework like the Orbit proposed.			147	49	12	6	1	16	5.242	87.37
Orbit framework covers all the learning dimensions in UoMust.			89	35	45	24	7	31	4.354	72.58
Developed the technological domain in the framework is important			167	47	10	0	0	7	5.558	92.64
Developed the managerial domain in the framework is important			67	40	29	44	9	42	3.939	65.65
Developed the educational domain in the framework is important			65	62	17	27	22	38	4.03	67.17
The wireless technologies and its progressed push it to play a big role in the learning process.			123	66	27	10	3	2	5.255	87.5
Adopting e-learning in UoMust need for a good human resources capacity building plan			143	37	16	5	11	19	5.034	83..91
Adopting e-learning in UoMust need for a clear			144	23	27	3	7	27	4.922	82.03

and good step by step strategy.								
Adopting e-learning in UoMust need for a good video conference learning environment (VCLE).	122	39	43	12	7	8	**5.00**	**83.47**
Orbit framework could be used in Iraq higher education universities	71	48	26	29	33	24	**4.099**	**68.32**
Wireless technologies are the solution for the Iraqi infrastructure problems.	34	15	72	76	26	8	**3.701**	**61.68**
Wireless technologies are the solution for the Iraqi funding problems and the lowest in costs.	18	17	167	6	9	14	**3.943**	**65.72**
Focusing on the capacity building for the senior academic staff is very importing factor in adopting it.	123	39	11	5	2	51	**4.352**	**75.54**
It is very important to build a clever e-gate for UoMust instead of the UoMust president news website	89	37	62	26	5	12	**4.619**	**76.98**
It is very important to design the learning materials to be used in mobile learning also as future step	54	17	27	77	35	21	**3.632**	**60.53**
Start thinking about to certified distance education is very important step towards develop UoMust	42	83	21	21	26	38	**3.913**	**65.22**
The proposed e-education for the UoMust is complete what it needed to install e-learning	62	47	51	34	17	20	**4.186**	**69.76**

7. CONCLUSION

In Taiwan, they start to build the intelligent class rooms "create an intelligent classroom embedded with individualized and interactive learning materials and assessment tools" , and in Iraq, we still after the wood blackboard .(Chang & Lee, 2010).

Dealing and designing for human beings is a very dangerous operation and to achieve it, all the elements of the design was studied very carefully and in e-learning we need to study a lot of different elements in its nature and try to find the correct formula for the best design and frameworks.

From 2003 and even before in Iraq, all these types of designs are done suddenly without any studying or planning and most of the decision makers are completely away from any kind of understanding the new learning theories and the impact of the ICT technologies in education and learning and still focusing on the chalk and talk as the best way of learning in face to face learning methods.

Khan framework was truly a revolution in the field of e-learning and for more than 16 years this framework is standing strongly in this field, and we hear from him two years ago how he designed his framework and added the eight dimension to his framework and our trial is completing what he had started, and we still believe in his framework and think it is one of the best frameworks but it cannot properly work in all learning different environments and as a word of truth as we stated we start from his framework.

At the end our framework becomes a completely different framework from Khan Framework with the similarity in some of the framework elements, and we believe that they simulate between the learner and any e-learning element is a very important and continuous operation.

After studying the learning environment and factors influencing the design we have a special framework for UoMust and the Iraqi higher education.

It was found that any e-learning project tries to complement the traditional way of face to face teaching method is best to be in a blended learning mode. To enhance the development of teaching and learning methodology through sharing of information on the latest pedagogical technique and delivery system for the students.

• Preferably to upgrade the ICT knowledge and skills in students and lecturers.
• Preferably to increased usage of ICT in educational management.

While the States of America fund the education sectors with huge numbers of the money to use up to date educational technologies(Executive Office of the President of the USA, 2010) , and the same in a lot of the other countries the Iraqi budget for education is still less than 5% of the complete Iraq budget and Iraq is a rich country and its budget for 2011 is more than 80 billion dollar. In States now days a lot of universities in its classic studies start to adopt at least one subject to be online and in Iraq, Jordan ,.. etc. we have still not accredited distance education.

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ELAMEER-IDRUS ORBITAL E-EDUCATION FRAMEWORK FOR THE UNIVERSITY OF MUSTANSIRIYAH (UOMUST)

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ABSTRACT

The study of the university of Mustansiriyah case show us very clear that university suffers from a lot of problems start from the security , technology , management , pedagogical and ethical. Based on a pre-questionnaire survey about e-learning results, interviews and studies show us the need to the complete e-education system. Continuous scrutiny and study of the Iraqi higher education showed us very clearly there was something missing and need to be more reinforced in our modified Khan framework especially with the revolution of the wireless technologies. A framework was designed with many added dimensions like stability, time, learner, content control, standardization, scalability and modularization. As a result, a new framework, is an *ELAMEER-IDRUS* orbit e-education framework with a good acceptance at the post evaluation process that was achieved from a group of 231 senior academics.

Keywords : University of Mustansiriyah (UoMust) , e-Education , Khan e-Learning framework , Modified Khan e-learning framework

1. INTRODUCTION

There are no doubts about the benefits of educational technologies to higher education and the impact on the learning process; in Iraq it demands for a change in the mindset of the students, lecturers, administrators of the universities, learning leaders, and the decision makers(Harb, 2008; Husain, 2004). Nowadays, the linear learning methods are obsolete and replaced by a cyclical new modern methods. Students now can start with study, go to work and come back to study again. This cyclic pattern will be the future feature of higher education, and technology will be the catalyst in realizing the flexibility, simplicity, durability, standard ability, scalability and mobility. E-learning could also easily customize the academic programs based on the demands and the geographical, culture, technological constraints of the students.

Iraqi universities are in urgent need for e-education systems and also the ministry need for the e-ministry, since the e-education are the focus on the learning and pedagogical factors. E-education can be defined as the learning process that involves e-learning with the different administrative and strategic measures needed to support the learning in an Internet environment, and it will incorporate a local, regional, national and international view of education. Most of the lecturers found them self without any instructional aides or educational technologies to use it because of lowest governmental budgets, especially in education systems with monitored increasing in the students' numbers.

Previously like all the education systems in the world the learning concept in Iraq was teacher-centered, and when the world start to change this concept and start making the learner as the core. The Iraqi education system starts to concrete the lecturer role as the core and center of the learning process. The reason for that was :

1-Difficult economic living condition in all of Iraq, missing the required concentration for the students and learner.

2-Government focusing on the quantity not quality of the graduates.

3-Learner core concept starts at the end of the eighteen decades when the Iraqi economy starts to fall down pursuant to the first gulf war.

As a result of complications and the circumstances that have passed on Iraq and the characteristics of the universities educational environment, it has been found that the adoption of any educational e-learning model or framework will not be useful for UoMust or the Iraqi universities because of the many factors that will play a big role in affecting e-education in Iraq's universities, and it was necessary to build a special e-education framework which considers all the education dimensions into consideration in Iraq to reach the best of the quality teaching.

After scrutinizing the e-learning framework from past researchers, it was found that each designer put their own ideas in the framework but most of them stated some factors that could influence an electronic learning system. Some variables in this research were selected from literature that was

reviewed and others were from interviews with experts in the field of e- learning in different science sectors. Many studies have identified important variables dealing with an electronic learning system.

2. METHODOLOGY

The ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) was utilized in the study. Our framework is a result coming from :

1-Searching for the best e-education and e-learning frameworks in the previous studies and literatures.

2- An exploratory research of the state-of-the-e-learning and e-education and their future perspectives in our research context about Iraqi higher education.

A specially formulated questionnaire was designed and distributed between a group of Iraqi Mustansiriyah University staff to investigate the direction towards the e-learning elements, management & institutional problems, which are the basic elements of the proposed strategy and that could face the implementing e-education projects, the benefits that will be gained to the higher education sector, and the technology problems.

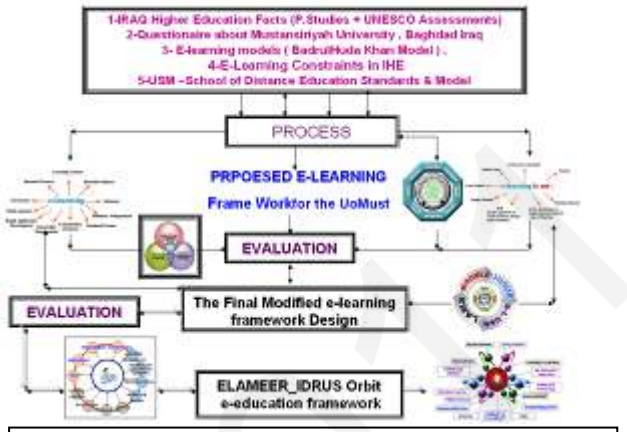

Figure.1 : The research methodology framework

3. THE INSTRUMENT

The Statistical procedure and the data analysis is one of the most important parts of the research work, and according to (Marczyk et al. 2005) "in most types of research studies. The process of data analysis involves the following three steps: (1) preparing the data for analysis, (2) analyzing the data, and (3) interpreting the data". At the preliminary stage, a survey technique was used to collect the data and prepare it for the analyzing through a questionnaire of 44 statements for the e-learning and ICT skills in the UoMust. Preparation of the data for analysis was collected from the questionnaire which was divided into two parts. The first was the general and personal information the second included the targeted questions that as divided into five categories of management, institutional, technology, human resources and general.

The questionnaire was distributed between the academicians and after completing the framework design and at the final stage a post evaluation was achieved by a questionnaire of 50 statements about the design and all its elements and components.

All the statements and feedback were analyzed and computerized using the statically package for social science (SPSS) to obtain the mean (M), standard deviation (St.D), percentages (%). A Likert scale of six points was used (Gelin 2003), and they are: strongly agree (SA)-6, agree (A)-5, neutral (N)-4, disagree (DA)-3, strongly disagree (SDA)-2, don't know-(DK)-1 ((Kaghed & Dezaye, 2009);(Mohammad, 2008)).

4. THE ORBIT FRAMEWORK:

The power and effectiveness of these new tools and methods are always being associated with the electronic learning methods, pedagogy, technology, institutionally, managerially, equity, ethically, interface designs and the way to access and any other variables could play a role in the learning process. To change this situation, we need to build a complete education system its core or center is the student or the learner since the researches and all the up to date educational theories prove that and encourage to design the learning environments centralizing the student or learner for an e-Education framework for the University of Mustansiriyah.

The Khan framework portrays a comprehensive theoretical e-learning model. E-Learning can be defined now as Badrul H. Khan stated: An innovative approach for delivering well designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime, by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open and distributed learning environment. The emergence of this frame work made the greatest impact in the revolution of e-learning that take place in the all of the learning sectors since this framework,

for the last 16 years, described all the education and learning process. Further, the framework also offered the logical base for all the e-learning instructional designers on how to design and implement effective learning environment in the e-learning process using the interactions afforded via computers and the internet, considering and stating all the factors that could affect the proposed designs. The Khan framework is still widely utilized until today.((Khan, 2004, 2009; Khan & Granato, 2007)).

And according to the results that we obtain it from a UoMust surveys and studying the Iraqi higher education status we find that the elements that to be considered in any framework design are:

1-Pedagaogical, 2-Ethical, 3-Evaluation, 4-Technological, 5-Interface Design, 6-Institutional, 7-Management, 8-Wireless Technologies, 9-Time, 10-Content Control, 11-Human Resources Capacity Building, 12-Evaluation , 13-Learner. as shown in figure .2.

The Khan framework was modified and a new e-learning framework was built for the UoMust with 12 dimensions as shown in figure .3.

The e-learning elements was divided into three main trajectories, and they are, 1- Technological, 2-Organizational, 3-Educational, and each trajectory has its own elements that related to its functionality and Characterize by its main mark.

We believe that learning is completely systematically operation because it's dealing with the humans whatever its type was, and any systematic operation needed to be stable from the beginning and starting to its final goal or end, and learning must be stable operation in all its steps or phases.

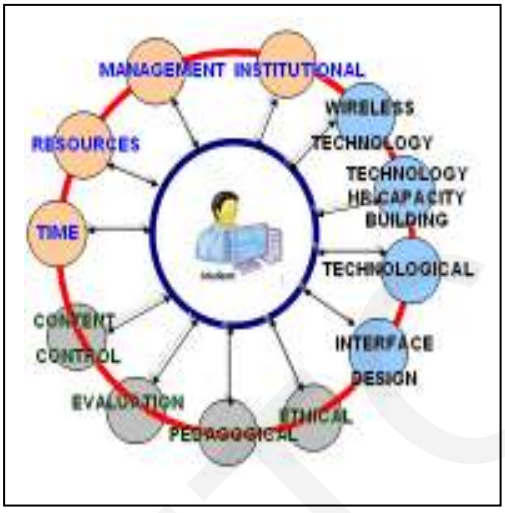

Figure.2 : All e-learning dimensions and elements

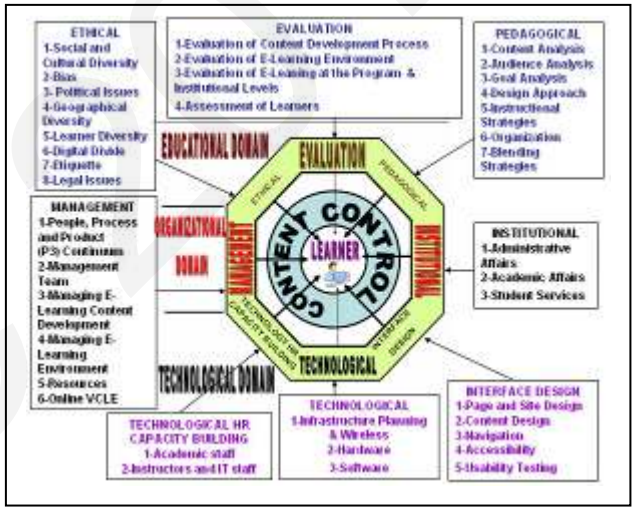

Figure.3 : Modified Khan e-learning framework

In all the investigated models, we never found any model deal with this element that could effect and destroyed all the learning process because most of the designers are backgrounds are stable and consistent. In Iraq, it is a completely different case, and nothing is stable at all and small examples for that in Iraqi higher education undergraduate studies, they invent the third trial exams for whom that fail to reach the exam's rooms in the fixed time and date.

This is in the face to face traditional learning process, and more stability is needed in an electronic learning process. From that point of stand stability become a very important element if we are designing or trying to design e-learning or e-education activities in un stable countries where everything is not stable or going to be stable in the near future, and we also believe adopting such a stable framework could push strongly towards the stability of the learning process. We believe that the technological is the base and the foundation for our framework and for that we give this trajectory the main position inside the design and build all other elements according to its up to date new technological shapes after the ICT revolution which changes all old standards and concepts. These trajectory's elements are :

4-1- Technological Trajectory: the e-learning elements here must be scalable and stable and the elements are: Technology, Wireless technology, interface design, and technological human resources capacity building.

One computer to one learner is a very difficult formula to reach in any learning institution, especially with the same specifications.((Bielefeldt, 2006). Internet speed, or bandwidth, was a crucial issue for performance in large e-education networks. Studies have shown that the introduction of high-

access computing can change the nature of instruction , and the strategies learned with technology may not be the same ones required for standard assessments of learning (Means & Olson, 1995).

"E-learning should ensure sufficient bandwidth is available to support the type of online learning applications being used and to ensure e learners have opportunities for face to face experiences in conjunction with their e-learning."(Ismail, Idrus, Ziden, & Fook, 2009).

ICT technology is the base for our framework, and it is the main trajectory that we build our system on it and without it, there is no e-education. In the Technological trajectory, we have four dimensions, and they are**:**

4-1-1-Technology: The technological dimension of e-learning examines issues of technology infrastructure in e-learning environments. This includes infrastructure planning, hardware, and software and according to that the changes in the education system in Iraq will be completely 180 degree turn, and everything will up to date and new. With considering that most emergent technologies are not widely having an adopted standard (hardware or software).

4-1-2-Human Resources Capacity Building: (MacDonald, Stodel, Hall, & Weaver, 2009) stated that if people did not have positive attitude, knowledge and skills of ICT, the e- learning program fails. Knowledge and skills have a direct impact on using e-learning. Since most of Iraqi universities suffers from the luck of required skills, (Elameer & Idrus, 2010), and we think Iraq needs to increase the believing in ICT which we think it will re shaped the education system completely.

4-1-3-Interface Design: The interface design refers to the overall look and feel of e-learning programs. The interface design dimension encompasses page and site design, content design, navigation, accessibility, and usability testing (((Khan, 2005; Rosenberg et al., 2007) and it is a very important element because it could be the way to the success, or they fail of any frame wok.

4-1-4-Wireless Technology : The growing development and application of wireless Information and Communication Technologies (WICT) opens new windows and opportunities for education improvement and redesigns the organizational and educational settings and shapes

To increase process polychromic, i.e., the possibility to deal with several tasks simultaneously. There is also a social context that includes different cultural formations, situations and moods, degrees of proximity and mutual recognition among people, etiquette and other elements that define what is or is not allowed in certain situations.

4-2- Organizational Trajectory: The e-learning elements here must be standardized according to the progressed university standardization and the elements are: Institutional, Management, Resources, and the Time. Furthermore, the organizational standard must be stable, and do not influence by the country or society changing winds only if it is to the better. The Stability of the universities is one of its basic academic characteristics, and we can find very clearly how the rules and regulations of the big names' universities like Cambridge, Oxford, UCL ,..etc. still same from long years ago and this a big indication for these universities organizational stability.

In Iraq the case is completely different and nothing is stable at all, and this comes from the changing of the regime in Iraq and missing universities stability come as a result for the country transform to the democracy.

In the Organizational trajectory, we have four dimensions, and they are:

4-2-1-Institutional: The institutional dimension is concerned with issues of administrative affairs, academic affairs, and student services related to e-learning.

4-2-2-Resources: The resource support dimension of e-learning examines the online support and resources required to foster meaningful learning

4-2-3-Management**:** The management of e-learning refers to the maintenance of the learning environment and distribution of information and lack of ongoing support from management, failure to perform meaningful reviews to ensure an environment of continuous process improvement, etc.(Idrus, 2008).

4-2-4-Time: Time is considered a very important dimension in any innovative implementation of e-learning framework with considering the differences between the student achievement capabilities and the individualized differences, but we can keep time open without any upper limits or an end.

Availability of time must be adequate time and compensated time for users to become educated and skilled in how to use an innovation. This condition refers not only to the organization's willingness to provide time (such as paid time or release time) but the users' willingness to devote learning time to use the innovation.(Idrus 2008)

4-3-Educational Trajectory: The e-learning elements here must be modularized according to the Iraqi student's characteristics, and the elements are: Pedagogical, Evaluation, Ethical and the Content control.

In IT and in general Modularity definition is the property of the software (computer programs) that measures the extent to which programs or software have been composed out of separate parts called modules.

Modularity in learning is the same concept, and it is defined as the property of allowing to encapsulate, expose and separately reuse parts of a learning resource.

The framework has been designed to modularized the digital learning content, and it has been addressed as a part of the concept of learning objects.

The framework presented in this research can be used as the basis for a good foundation for modularization of the VLE. By modularizing the VLE, new functional components can be easily added in a way that makes them work as an integrated part of the overall learning environment.(Paulsson & Berglund, 2006).

In the Educational trajectory, we have four dimensions and as a word of the truth Khan 2009 framework had covered three dimensions completely, and we cannot find any missing element in his work in the field of pedagogical, ethical and evaluation as educational dimensions, but we also believe that content control should be added here as a new dimension to the educational trajectory.

With any technology, the effects on teaching and learning to depend on integration with curriculum and instruction (Bielefeldt, 2006)

4-3-1-Pedagogical: The pedagogical dimension of e-learning refers to teach and learning. This dimension addresses issues concerning content analysis, audience analysis, goal analysis, media analysis; design Approach, organization, and learning strategies.

4-3-2-Ethical: The ethical considerations of e-learning relate to social and political influence, cultural diversity, bias, geographical diversity, learner diversity, the digital divide, etiquette, and legal issues.

4-3-3-Evaluation: The evaluation of e-learning includes both the assessment of learners and the evaluation of the instruction and learning environment.

4-3-4-Content Control: The central ideology of learning theories is that learning occurs inside a person. Learning theories are concerned with the actual process of learning, not with the value of what is being learned.

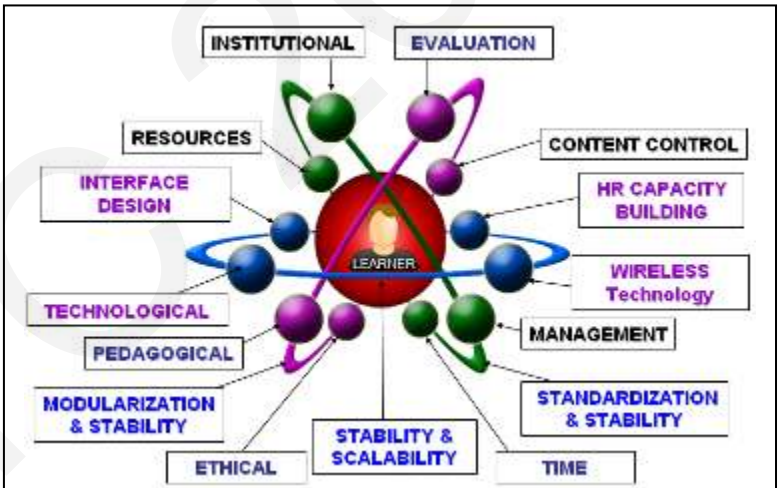

Figure.4 : ELAMEER-IDRUS e-Education Framework

In general content must be cooperative, collaborative and each learner has a learning path that caters for learners learning needs and interests in a productive. Students learn in differing ways and the manner in which information is presented to them affects their ability to learn (Kahiigi, Ekenberg, Hansson, Tusubira, & Danielson, 2008). Students need to utilize the different learning styles interchangeably during the learning process in order for them to have an effective learning experience.

"Technology-enhanced student-centered learning environments organize interrelated learning themes into meaningful contexts"(Muniandy, Mohamad, Fook, & Idrus, 2009).

In order to achieve that (Moodle 1999) can help us and it are developed to facilitate the collaborative creation of content, organization, control and to manage the publication of documents in a centralized learner learning environment.As a final result the e-Learning context, advancement in network technologies, e-Learning technologies, and content development has facilitated multiple content presentations, personalization and ubiquitous learning. After studying each element and its direct effect to the student in the e-learning process, the framework was akin to the mechanics of orbital motion of the electrons that is moving in circular orbits at the constant speed around a nucleus, and when we finally understand the electron movement, we discover that each electron actually moves in a "wave pattern" where bodies (learning elements) with a slight difference en masse orbiting around a common barycentric (student as the core of the learning process). As such, the framework was reshaped into an orbit shape with the three trajectories and the design as orbital e- education framework.

5.ADVANTAGES OF ELAMEER-IDRUS ORBITAL E- EDUCATION FRAMEWORK

The instructionally designed orbital e-Education framework that will be used to digitize education activities and comprehensively covers all the education dimensions in UoMust is presented in Figure .4 with all the dimensions and sub-dimensions details. It has the following advantages:

1- The first framework that pays great attention to capacity building and ensuring well training for productive application

2- The first framework to study time. In the new world, time is money and in education we cannot keep it open freely without any control.

3- The first framework to study the up-to-date wireless technologies and their great benefits to the learning process. It is also the first to identify technology as a factor that can influence learning process or even end it.

4- The first framework to take modularization into consideration.

5- The framework could be useful and applied in any e-learning process, because we have taken into consideration the factors of M-learning, B-Learning and U-learning.

6- The first framework to take scalability into consideration.

7- The first framework to take standardization into consideration.

8- The first framework to take stability into consideration.

6.THE POST-EVALUATION RESULTS

The results of the post evaluation for the new orbit model come in the highly positive side and (87%) of the academic staff welcomed the e-education orbit framework and encourage widely to adopt it and use it and (72 %) believe that it covers a lot of the e-learning area and then using of this framework in the higher education come in the accepted zone with (69%). The good technological area in the orbit framework was completely in the positive side (excellent) and (92%) welcomed the strong technological domain in the framework. The solution of missing communications infrastructures by the wireless up to date technologies in the technological domain was very good grade (87%) and was welcomed . The managerial domain and its developed come in the accepted grade range (65%) and also the same for educational domain (67%). Human resources capacity building was also welcomed and come with (83%) in the zone of the very good grade and (75%) want the focusing of the HRCB to be on the senior academic staff. Furthermore, the VCLE was one of the e-learning component and (87%) welcomed adopting e-learning in UoMust need for a good video conference learning environment.

Distance education still away from the Iraqi higher education because of the luck information about it and its great benefits and the thinking about to certified distance education is come only with (65%) in the grade of accepted only and also the new mobile learning technologies are still also a way (60%) and in accepted grade and this result was completely known to us since the mobile technology is still at its first steps and mobile using was just allowed in 2004. The result obtained from the post evaluation are shown in table.1.

Table . 1 : Some of the result obtain from the post evaluation

Excellent 90-100	Very Good 80-89	Good 70-79	Accepted 60-69			Poor 50-59			Very Poor Less than 50	
Statement			SA	A	N	DA	SDA	N	MEAN	%
UoMust need for a complete e- higher education system as the proposed			117	72	21	10	6	5	5.146	86
E-learning in UoMust need for a good MIS (Management information system)			89	95	5	13	4	25	4.766	79.43
Adopting e-learning in UoMust need for a good framework like the Orbit proposed.			147	49	12	6	1	16	5.242	87.37
Orbit framework covers all the learning dimensions in UoMust.			89	35	45	24	7	31	4.354	72.58
Developed the technological domain in the framework is important			167	47	10	0	0	7	5.558	92.64
Developed the managerial domain in the framework is important			67	40	29	44	9	42	3.939	65.65
Developed the educational domain in the framework is important			65	62	17	27	22	38	4.03	67.17
The wireless technologies and its progressed push it to play a big role in the learning process.			123	66	27	10	3	2	5.255	87.5
Adopting e-learning in UoMust need for a good human resources capacity building plan			143	37	16	5	11	19	5.034	83..91
Adopting e-learning in UoMust need for a clear			144	23	27	3	7	27	4.922	82.03

and good step by step strategy.								
Adopting e-learning in UoMust need for a good video conference learning environment (VCLE).	122	39	43	12	7	8	**5.00**	**83.47**
Orbit framework could be used in Iraq higher education universities	71	48	26	29	33	24	**4.099**	**68.32**
Wireless technologies are the solution for the Iraqi infrastructure problems.	34	15	72	76	26	8	**3.701**	**61.68**
Wireless technologies are the solution for the Iraqi funding problems and the lowest in costs.	18	17	167	6	9	14	**3.943**	**65.72**
Focusing on the capacity building for the senior academic staff is very importing factor in adopting it.	123	39	11	5	2	51	**4.352**	**75.54**
It is very important to build a clever e-gate for UoMust instead of the UoMust president news website	89	37	62	26	5	12	**4.619**	**76.98**
It is very important to design the learning materials to be used in mobile learning also as future step	54	17	27	77	35	21	**3.632**	**60.53**
Start thinking about to certified distance education is very important step towards develop UoMust	42	83	21	21	26	38	**3.913**	**65.22**
The proposed e-education for the UoMust is complete what it needed to install e-learning	62	47	51	34	17	20	**4.186**	**69.76**

7. CONCLUSION

In Taiwan, they start to build the intelligent class rooms "create an intelligent classroom embedded with individualized and interactive learning materials and assessment tools" , and in Iraq, we still after the wood blackboard .(Chang & Lee, 2010).

Dealing and designing for human beings is a very dangerous operation and to achieve it, all the elements of the design was studied very carefully and in e-learning we need to study a lot of different elements in its nature and try to find the correct formula for the best design and frameworks.

From 2003 and even before in Iraq, all these types of designs are done suddenly without any studying or planning and most of the decision makers are completely away from any kind of understanding the new learning theories and the impact of the ICT technologies in education and learning and still focusing on the chalk and talk as the best way of learning in face to face learning methods.

Khan framework was truly a revolution in the field of e-learning and for more than 16 years this framework is standing strongly in this field, and we hear from him two years ago how he designed his framework and added the eight dimension to his framework and our trial is completing what he had started, and we still believe in his framework and think it is one of the best frameworks but it cannot properly work in all learning different environments and as a word of truth as we stated we start from his framework.

At the end our framework becomes a completely different framework from Khan Framework with the similarity in some of the framework elements, and we believe that they simulate between the learner and any e-learning element is a very important and continuous operation.

After studying the learning environment and factors influencing the design we have a special framework for UoMust and the Iraqi higher education.

It was found that any e-learning project tries to complement the traditional way of face to face teaching method is best to be in a blended learning mode. To enhance the development of teaching and learning methodology through sharing of information on the latest pedagogical technique and delivery system for the students.

• Preferably to upgrade the ICT knowledge and skills in students and lecturers.
• Preferably to increased usage of ICT in educational management.

While the States of America fund the education sectors with huge numbers of the money to use up to date educational technologies(Executive Office of the President of the USA, 2010) , and the same in a lot of the other countries the Iraqi budget for education is still less than 5% of the complete Iraq budget and Iraq is a rich country and its budget for 2011 is more than 80 billion dollar. In States now days a lot of universities in its classic studies start to adopt at least one subject to be online and in Iraq, Jordan ,.. etc. we have still not accredited distance education.

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E-LEARNING POLICY FORMULATION IN THE EUROPEAN UNION AND THE UNITED STATES: A COMPARATIVE ANALYSIS FRAMEWORK

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ABSTRACT
The corresponding emergence, timing, rhetoric, and strategies employed in e-Learning policy in both the EU and the US are notable. Comparative e-Learning studies taking the EU and the US as equal units of analysis are currently in short supply. This inquiry employed a comparative content analysis of e-Learning policy documents drafted at federal level in the EU and in the US to detect convergences and divergences in e-Learning policy development. The purpose was to develop a framework that navigates the functions and purposes of "federal" level e-Learning policy and its evolution over the past two decades, and to provide a comparative overview and analysis of EU's and US e-Learning policies. The aim was to identify consistent trends, discernable patterns, and points of convergence in policy development in the EU and the US, as well as themes, tensions, and contextual divergences, substantiated through empirical review of policy documents and official reports.

Introduction

As a starting point, we view the emergence and development of higher level policy regarding e-Learning by governing bodies as a common phenomenon in response to the historicity of the development and proliferations of ICTs in societies. Brown, Anderson and Murray (2007) have detected common phases in the evolution of e-Learning policy across international contexts. The corresponding emergence, timing, rhetoric, and strategies employed in e-Learning policy in both the European Union and the United States are notable. In response to globalizing trends, the EU and the US are prompted to respond to economic, environmental, security and other social concerns through policy formulation, and there is a growing body of literature comparing EU and US policy responses (Hoornbeek, 2004; Kelemen, 2002; McKay, 1999; Mckay, 2005; Mendez, 2005; Mendez & Mendez, 2009; Obinger, Leibfried, & Castles, 2005). This study offers a comparative analysis of e-Learning policies developed in the EU and the US and aims to establish a coherent framework for a policy comparison between the two governing bodies.

Given the rather fragmented research literature comparing European countries with the US in this regard, this study aims to look at the two political entities from a level playing field perspective. The EU's increasing competence in educational matters as a governing body has created a space for policy making that is more characteristic of a political assembly resembling a federal approach to education. In this sense, this research argues that the EU and the US can be viewed as comparative entities and that a look at e-Learning policies necessarily has to take into account the increased powers of decision-making of the EU as a whole, not as a collection of disparate states when it comes to an instructive analysis of policies on the two sides of the Atlantic. Correspondingly, the federal approach to education policy in the US also presents challenges in implementing more centralized, coherent policy pertaining to e-Learning in specific as well as education reform in general, offering an informative analysis of concomitant policy processes.

Echoing Salajan's (2007; 2011) explication of e-Learning policy in the EU and building on McMillan Culp, Honey and Mandinach's (2003) analysis of twenty years of education technology policy in the US, this project endeavors to provide a comparative overview and analysis of the EU level and US federal level policies on e-Learning. In doing so, we also propose a framework that navigates the functions and purposes of e-Learning policy and its evolution over the past two decades. The aim is to identify consistent trends, discernable patterns, and points of convergence in policy development in the EU and the US, as well as themes, tensions, and contextual divergences, substantiated through an empirical review of policy documents and official reports. This analysis is intended to contribute to and inform scholarly work in the field of educational technology as well as inform discussions regarding e-Learning policy development.

In succession, we will address the elusive term e-Learning and provide an instrumental definition for the purpose of our analyses. Next, our rationale for employing the EU and the US as comparable units of analysis will be revealed. Following the clarification of methods and research procedures, a sketch of the historical development of e-Learning policy is provided for both the EU and the US. Finally, we offer our analyses of EU and US e-learning policy comparatively, and offer some interpretations of the coextensive evolution of e-Learning in the EU and US.

e-Learning Defined

In an attempt to develop a more holistic understanding of e-Learning that takes the wider continuum of definitions into consideration, and drawing from some of Oblinger's and Hawkins's (2005) thinking on demystifying e-Learning, we propose an instrumental definition that confirms the notion that e-Learning is primarily a mechanism for the informed integration of ICT into teaching and learning, but it is operationalized through processes, products and systems that make such integration possible.

1. *Processes*. The processes to which we refer are comprised of the educational transformations facilitated by ICT, both in terms of encouraging the refinement of instructional methodologies and in regards to the procedural or technical requirements for the mainstreaming of ICT in education. Moving in either direction along the continuum of traditional-->technology--enhanced-->entirely technology-mediated education, contemporary ICT have now taken a vital role in supporting learning outcomes in face-to-face, online and hybrid environments. At the same time, the creation of infrastructures and human or material resources necessary to support educational endeavors is premised on strategies that are the result of policy processes without which ICT would not have become part of the educational landscape.
2. *Products*. Digital learning materials as well as the qualitative results of their utilization in education constitute products of ICT integration. As Oblinger and Hawkins (2005) also suggest, the rising trend in the development of interactive applications, simulations and visualizations across the educational environments mentioned above, indicate that such products improve student understanding of complex concepts. By extension, this is to further say that the accumulation of knowledge, ideas, values, beliefs and skills mediated by these applications are products that bear the indelible mark of digitization.
3. *Systems*. Whether we speak of physical computing infrastructures and networks or the curricular structures enabling learner access to ICT-mediated education, we think of systems put in place for the purposeful delivery of media-rich educational content.

Therefore, we conceive of e-Learning as an amalgamation of tangible and intangible elements of infrastructural development, policy formulation, and educational planning working in concert for the systematic incorporation of ICT in education. With this understanding of e-Learning in mind, we may proceed with a description of the rationale for our comparative framework analysis of EU and US e-Learning policy.

EU and USA as Comparable Governance Regimes

We feel compelled to provide a rationale for this comparative analysis, and some clarification as to why the EU and US as "federal" governing bodies can be taken as comparable units of analysis in regards to e-Learning policy. Employing the EU as a unit of analysis in comparative research may be viewed as problematic, mainly due to the difficulty of classifying the EU as a political system. Research in this particular sub-field of comparative education continues to take a cross-national approach, placing the US side-by-side with the national sub-units of the European continent (Hansson, Mihailidis and Holmberg, 2005; Anderson et al, 2006). Not only is this approach unbalanced, but it also appears to ignore the process of European integration that has taken place over the last decade in European education. Nevertheless, simply stating that the US and the EU are comparable in eLearning policy dynamics does not represent a sine qua non justification.

An understanding of these two polities as comparable systems of governance is better served if they are situated within a larger discourse related to policymaking in network governments (Koch, 2007) or in multi-level governance systems (Hooghe and Marks, 2003). In a departure from comparisons at sub-systemic level, it could be argued that differences between the EU and the US as regimes of governance represent variances along a continuum that is common to them at a fundamental level. The notion that the EU represents an n of 1, that is, an entity in its own right, has already been advanced in this field, in a rational effort to legitimize a macro-level approach to EU politics (Caporaso, Marks, Moravcsik and Pollack, 1997).

Lowery et al. (2008) state that "to increase the comparability of a concept across political systems, one should reduce its characteristics and thus at the same time enlarge the class of things it applies to" (p. 1235). Despite the differences in historical evolution, both systems are somewhat fluid in functioning. The US federal arrangement, although in place for more than two and a quarter centuries, is still evolving (Glencross, 2009; Vause, 1995) and has been referred to as a sui generis system (Menon, 2006). Mirroring this, Vause also recognized the potential for the EU, through its subsidiarity principle, to become a more federal political system resembling the US. An exhaustive treatise of the federal political-institutional characteristics is not possible in this limited space, but suffice it to say that it is not unprecedented nor unreasonable to prepare a level playing field in our analysis of e-Learning policy formulation between the two political regimes. Without minimizing the marked differences in the political systems of the EU and US, our argument is that both entities present similar functions and processes in their instruments of governance with mixed outcomes. Consequently, the following section presents our proposed analytical framework for our comparative approach.

Comparative Analytical Framework

Comparative federalism constitutes the first layer of our conceptual framework for analysis. Mendez & Mendez (2009) make an excellent justification for case selection in comparing the EU and the US from the perspective of federal theory. This layer approaches e-Learning policy comparatively in terms of *policy framing*, *policy dynamics* and *policy instruments*. Policy framing refers to the perceived internal and external threats to a polity that motivate decision-makers in that polity to devise policies that will address those threats. Policy dynamics refers to how the various actors in a polity interact and assign themselves responsibilities in the course of policy development. Policy instruments are the vehicles that transpose into practice the goals of the polity through reasoned action and expressly stipulated objectives. These facets of policy provide the overarching structure for our comparison and discussion. The next level of our conceptual framework consists of uniting our e-Learning definition with functions of policy that sustain e-Learning integration. These facets were used in the creation of a data analysis matrix that guided our comparative content analysis of both EU and US policy documents. Finally, the temporal contingencies of e-Learning policy were a major consideration in our analyses and discussion of the conterminous evolution of EU and US e-Learning policy. The purpose of filtering the language of the documents was to capture distinct themes of convergence and divergence in policy evolution. It is important to note that the analysis of the identified documents was not intended to reflect all of the intricacies of e-Learning policy nor the specificity of the historical processes within both contexts, but rather to identify emerging patterns in policy development within both federalized systems as a means to systematically promoting e-Learning in response to the global education context.

Findings and Discussion

Policy Framing

Competition. The coetaneous evolution of e-Learning policy in both the EU and the US suggests a global stigmergy (Harvey, 2010) in policy development. In eliciting the notion of stigmergy, it is important to understand how local activities are organized in space and time in order to explain how seemingly uncoordinated actors respond to stimuli provided through the medium of a common environment. In the case of EU and US federalized e-Learning policy development in response to global trends, stigmergy plays a key role where one acting body provides a stimulus stigma that entices other actors to respond and continue developing more strategic and coherent policies. The similarities and timing of developments of e-Learning policies in both the EU and the US suggest that each actor is answering the other's response to the shifting global environment. The rhetoric, policy language, timing, and evolution of EU and US e-Learning policies suggest that they are not being developed in isolation, but rather coterminously within the broader global policyscape. However, while comparative policy analyses reveal similarities in overall policy objectives and adopted means to address issues as these stem from common institutional models espoused in world polity, it is also important to explore how these approaches take on different meanings within the different contexts.

It becomes clear that e-learning policy, in particular, becomes a middle ground where economic and social policy meet and are negotiated within the context of broader global competition. The differentiation between the narratives of world class as leading the world, and world class as understanding, engaging with and sustaining the world is noticeable. There are also distinguishable contrasting themes between competition

and cooperation, as well as between education for national supremacy and education for global interdependence (Alexander, 2010). This is understandable when one considers the function of the US's national federalist system, versus the EU's federation of European states. The US aims to re-establish its leadership role internationally, whereas the EU's objective is to foster the cooperation and collaboration of many states regionally. While both focus on global competitiveness, the underlying purposes and assumptions differ as a result of the constellations of power that these polities represent.

It is interesting to note that US e-learning policy had an early jump start, as early as 1988 in fact, but has since been prone to pendulous, American bipartisan politics. The US leaped ahead with e-learning policy in the 1990s, with a seemingly cohesive and programmatic plan in 2000, only to lose momentum at the turn of the millennium with the 2002 national shift in focus to NCLB and the accountability movement. It was during this time, from 2001 on, that the EU began to quickly move forward with its e-learning policies, which are increasingly strategic, embedded, and of increasing scope, with the most important documents emerging in 2001, 2003, and 2006. As the EU has continued to steadily develop its e-Learning policies through the Lifelong Learning Programme, the US responded with its 2010 document that has once again catalyzed e-learning policy on the other side of the Atlantic and put forth the call for a more programmatic approach. While the EU has continued to progress its e-learning policies, the US finds itself in the position of having to re-evaluate, re-invest in infrastructures, and reformulate its e-learning policy approaches after a recess of nearly a decade. This leads to the evolving question of whose policy is responding to whom, and which acting body is providing the stimulus stigma that entices other actors to respond and continue developing policy?

Inclusion. The e-learning policy documents on both sides of the Atlantic sustain strong themes of inclusiveness in education systems and society, though these take distinctive forms in the EU and the US and are framed quite differently. Policy on both sides address problems of social exclusion and the need to improve access to education, educational technology, information and resources more equitably in society.

In the US, the earliest e-learning policy documents referred to access primarily in terms of infrastructure and making sure that schools and education institutions were being provided with computers, hardware, software, products and Internet access. In the late 1990s, the term access was reframed and began to be used more in terms of social accessibility of educational technologies, and less of a term referring to mere infrastructure issues. This is where the concept of the digital divide emerged, and the social contexts of educational technologies were taken into further consideration, highlighting the need for improving social access to computer, information and digital literacies making the education system more inclusive. This theme has remained strong in all of the American e-learning policy documents, and has moved on to concepts of Universal Design and the personalization of learning spaces for all individuals through the use of educational technologies. It is of interest that the themes of social accessibility, equity and inclusiveness continue to be framed as individual issues for US citizens, where technology offers personalized, individualized, and flexible solutions for individual learners. While the social context of accessibility and the social issues that contribute to the lack of access to education have been addressed in the literature for decades, these themes are not framed as social issues to be addressed in US policy, but rather technology is presented as a means for solving individuals' problems with lack of access. Instead of addressing the social dynamics that create barriers to accessibility and contribute to exclusion, technology is being presented as a solution for education reform hedging the social and cultural structures that reinforce the inequities long detected in the education system. While the language is strong in terms of aiming to provide better service to underserved populations through education technologies, the social issues leading to their exclusion are not addressed.

The EU's e-learning policy offers a strong narrative of inclusion primarily emphasizing social cohesion and cooperation across member states, and tersely touching on the ability of all individuals to take equal advantage of ICTs in education in European society. E-learning policy is primarily being leveraged to foster mobility, cooperation, exchange of ideas, and most importantly the cultivation of a European identity, so inclusion takes on a different flavor in the EU policy documents. The facilitation of mobility across all sectors in the EU is emphasized as a means of promoting economic flexibility as well as fostering a European culture and social cohesion. The discourse of the EU e-Learning documents is reaffirming education as a public good and a public responsibility. These are to be achieved through improved mobility, increased collaboration and cooperation, increased accessibility and lifelong learning, facilitating an EU identity, recognition of qualifications across states as well as employability and labor rationale. These are the means to the end of improving system coordination and enabling flexible learning paths throughout the EU. The

language in the European documents is much more focused on social systems, and seems less concerned with the specific technological means of supporting these.

Policy Dynamics

Both governing bodies seem, on the surface, to formulate policy mechanisms intended to encourage and facilitate voluntary compliance with the outlined goals and e-Learning action plans, but these are exercised differently in the EU and the US. In using an institutional approach that relates federalist notions to the governing bodies of the EU and US and comparing the outcomes of their e-Learning policy processes, we suggest that e-Learning policies in the EU and the US are the products of the system dynamics in which they were crafted. While there are analogous calls for increased integration of ICTs in education and more programmatic approaches to e-Learning policy on both sides of the Atlantic, and both polities rely on similar rationale, rhetoric, and justifications for e-Learning policy, the EU and the US conceive of, operationalize, and implement policy in very unique ways as a result of differing political pressures and distinctive institutional settings.

Both systems attempt to develop broad range e-Learning policy that can be integrated across agencies as overarching frameworks and guidelines for independent states who are attributed the responsibilities of integration and implementation. Both governing bodies aim to provide common definitions and goals in the face of competition, and leverage similar funding mechanisms to catalyze the development of e-Learning expertise, the convening of multiple stakeholders, and the generation of cooperation between states and institutions. Both federalist systems also urge voluntary compliance of the states, although the US has various mechanisms to intently exercise power by relying on other government agencies to provide incentives and tie-ins to funding for compliance, meaning the EU must rely more on indirect means and soft power. While the US may appear to have more means of ensuring compliance, it is not to be forgotten that education policy is not centralized in the US, and federal mandates are clearer for primary and secondary education, but much less so for postsecondary and higher education.

In terms of implementation, this may indicate that the EU will have more success with the horizontal integration across agencies and states (consistently embedding e-learning objectives across the Lifelong Learning Programme and its sub-programs), but that the US will be more successful with vertical integration and getting the e-Learning policies to "stick" as they are tied into other federally mandated standards and funding. The relatively coordinated planning in the EU may provide advantages in the formulation stage, especially regarding even implementation. The EU also appears to be less prone to shifts due to electoral politics as in the US, enabling the EU to continually improve and develop more comprehensive e-Learning policy. That said, the EU's success pends on whether the member states adopt and effectively implement the EU policies, which occurs more consistently in some places than others (however, this can also be said between states in the US). The EU effectively has no oversight tools to ensure consistent implementation within member states, and policies may not always be transposed and implemented as desired, whereby the US federal government has power and authority over all coordinating policy areas, and can better leverage this authority. A stronger, top-down approach like this may lend to consistency in US policy in general, however this is weak within the realm of education policy, and the political pendulum in the US undoes some of this authority as well. This may lead to more consistent implementation in the future, and may eventually lead to stronger oversight, but with that the focus appears to be relatively narrow which also leads to a more limited and legalistic approach. However, e-Learning policy within both polities appears to be increasing in scope across education sectors, and becoming more programmatic.

Policy Instruments

US e-Learning Policy Instruments. In the US, while a good deal of e-Learning policy has been developed at the federal level, the primary responsibility for education lies with individual states, and each state approaches its obligation to educate its residents individually. It follows, then, that the policy and practice of e-Learning in the US differs from state to state, in spite of federal level e-Learning policy and initiatives. As US education policy is not as centralized as in other countries and regions, in many ways it relies on the diffusion and adoption of policy and practice through state and individual institutions. With this in mind, the function of national policy, initiatives and federally funded research are to support and facilitate the process of dissemination of best practices and their integration both horizontally and vertically throughout state education systems. That said, it seems that there is movement toward more coordinated efforts on the part of

the Department of Education (DOE) to develop more common and interoperable approaches that would eventually apply to all states, and the guidance of the federal government has become much clearer and more influential over the progression of the past four NETP reports.

US federal policy language identifying the need to more systematically address technologies (ICT and computer mediated technologies) within the context of education appeared in 1983 in the federal report *A Nation at Risk,* and e-Learning succeeded rapidly in the 1990s. In early reports, emphasis was placed on the development of infrastructure and the installation of hardware in schools, and data collection and evaluation were centered on the physical access to computers and access to the Internet. At the beginning of the millennium, online learning became a primary focus for policy and a target for funding streams. Regional consortia were supported, and a number of large scale projects were formed with the aim of discovering best practices in e-Learning and online education. The 2010 report is a much clearer document that not only outlines specific, national, e-Learning goals, but also provides clearer recommendations to states, school districts, and educational institutions. The report also clearly outlines the responsibilities of the federal government, states, institutions, districts and local schools. Not only are goals clearly stated for multiple stakeholders, but this document also outlines point by point tasks to be performed in accomplishing the set objectives. The impetus is to provide a common definition and understanding of the formulae and procedures necessary in order to catalyze e-Learning and regenerate the American education system as a whole.

EU e-Learning Policy Instruments. The *e*Learning Action Plan was the first foray of the European Commission into proposing a concrete e-learning policy that was distinctively European in scope and complementary to the Member States' national plans for the implementation of technologies in education. The goals of the plan were ambitious and the text was somewhat drafted as a manifesto for building a European conscientious momentum in the widespread deployment of digital technologies in education for the benefit of the general social well-being and economic competitiveness. While the document is formal in terms of its proposed actions to be taken, the format is derived from what could be considered a white paper containing recommendations for further actions. The language is not as legalistic and tied in law references as the more formal policies published in the Official Journal of the European Union, partly because the document was drafted with the power of recommendation and partly because it could not have been imposed as a constraining instrument on the Member States' power of decision in carrying out their own national agendas for e-Learning. Not having its dedicated budget line from the European Union undermines, to a certain extent, its power of persuasion, but it compensates in advocating for e-Learning actions at European level by striking a cooperative tone in acquiescing to the primacy of Member States priorities in this field. Nonetheless, this seeming subdued attitude should not distract or mislead the reader in drawing the conclusion that the European Commission is in a weak position of persuasion, as the Member States themselves, through the powers they vested into the European Council ceded some of their own powers for the overall good of the fledgling European e-Learning project.

The *e*Learning Programme, though more succinct than the *e*Learning Action Plan, was a much more prescriptive and concrete document endowed with substantial power to influence efforts to incorporate e-Learning in the EU's educational apparatuses. The direct budgetary provision from EU funds, which was a consequence of the "negotiations" occurring among the European Commission, Parliament and the Council of the European Union, lent the *e*Learning Programme a level of authority on par with instruments that benefitted from similar allocations of money from the Community coffers. Furthermore, the legal character of the *e*Learning Programme was reinforced through explicit references to related programmes and to the "fundamental" law of the European Union, that is, the Treaty on the European Union. In a similar vein, the Lifelong Learning Programme, the current policy instrument encompassing a broad range of educational objectives for the European Union, is steeped in legalistic language particular to EU official documents. While no longer represented by a specific programme, e-Learning actions are embedded within the Lifelong Learning Programme. The scope of the Lifelong Learning Programme is not fundamentally changed, in that it continues the rhetorical line on a social, yet competitive Europe. In this sense, e-lLearning is streamlined with other policy instruments, both complementing and supporting them in the overall goal of social responsibility and economic competitiveness.

Convergences and Divergences. While both the EU and the US e-Learning policy have been evolving quickly in response to the emergence of ICTs in education, it is interesting to observe the similarities and differences in policy formulation. It is quite clear that the EU and US reports are generated for very different audiences. In the US, the National Education Technology Plan documents continue to outline a

broad vision, provide common definitions and understandings, and inform and educate technology directors and educators who work at the state and institutional levels. While the 2010 report displays a broader scope and a more programmatic approach, it basically serves the same function as the 1996 NETP. To gain a more comprehensive view of e-Learning in the US, one would have to examine policy within other agencies as well, like the Department of Commerce, and relations with organizations like the National Science Foundation, that also play pivotal roles in promoting e-Learning policy in the US.

In the EU, there are marked differences in the progression of policy documents indicating the continuing evolution and development of e-Learning policy. While the eLearning Action Plan was a policy instrument in itself, it did not exist in a vacuum or in isolation from other instruments in the EU's policy-making armamentarium, nor did it have the weight to effect on its own the transformative vision it proposed. Consequently, in order to operationalize the aims of the *e*Learning Action Plan, the European Commission had woven key measures of the plan within the scope of more established instruments. Four types of mechanisms were targeted by the *e*Learning Action Plan in its drive to promote a comprehensive adoption of technologies in education: several flagship educational programmes (Socrates, Leonardo Da Vinci, and Youth), EU financial instruments (Structural Funds, the European Regional Development Funds, the European Social Fund and the European Investment Bank; the Information Society Technologies programme under the auspices of the Framework Programme) and; programmes with socially-oriented themes (*e*Accessibility, *e*Content and *e*Inclusion). It should be noted that the *e*Learning Action Plan's dependence on this distributive approach to policy implementation did not degrade the importance of the plan's position within the panoply of actions devised by the European Commission to encourage the wide adoption of digital technologies. On the contrary, the *e*Learning Action Plan craftily found niches of policy deployment without sacrificing cogency and coherence in upholding a holistic European development of e-learning in the service of society. As was the case with the eLearning Action Plan, the eLearning Programme was bound in a set of other instruments that ensured its alignment with related European legislation. However, unlike the *e*Learning Action Plan, the *e*Learning Programme was nested in multiple layers of legal documentation that reached up to the Treaty on the European Union. This link to the TEU conferred the *e*Learning Programme a substantial basis for its implementation and an aura of legal weight, even though it was not binding on the Member States. Nonetheless, the single most important factor that created the conditions for the *e*Learning Programme to exert influence on the Member States was the express budgetary allocation attached to the programme. Any prospective grant of funds from the *e*Learning Programme required would-be recipients to establish transnational consortia to develop project proposals that included entities from at least three Member States. Thus, the *e*Learning Programme represented a significant step up in the consolidation of the legal framework created at European level for the promotion of e-learning objectives.

Conclusion

In this paper we provided an instrumental definition for e-Learning for the purpose of our analyses, suggesting that e-Learning is an amalgamation of tangible and intangible elements of infrastructural development, policy formulation, and educational planning working in concert for the systematic incorporation of ICT in education. Next, our rationale for employing the EU and the US as comparable units of analysis was highlighted, positing that both entities present similar functions and processes in their instruments of governance with mixed outcomes, and that the EU and US as "federal" governing bodies can be taken as comparable units of analysis in regards to e-Learning policy. Following the clarification of theoretical conceptualization and research procedures, we illuminated the framing of and historical development of e-Learning policy within the EU and the US. Finally, we offered our analyses of EU and US e-learning policy comparatively, and offer some interpretations of the coextensive evolution of e-Learning policy. Both governing bodies seem, on the surface, to formulate policy mechanisms intended to encourage and facilitate voluntary compliance with the outlined goals and e-Learning action plans, and e-Learning policy within both polities appears to be increasing in scope across education sectors, and becoming more programmatic. Finally, we finished with a cursive analysis of the policy instruments themselves in their respective contexts.

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E-LEARNING PROJECT MANAGEMENT GUIDE, A ROADMAP TO IMPLEMENT BEST-PRACTICE BLENDED MODEL

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ABSTRACT

This paper examines a guided methodology to apply and manage a blended e-learning management department inside any educational organization, specially k12 education. It first defines some concepts and terms used in both education field and project management field. Then the paper lists some benefits of blended e-learning implementation and corrects some wrong concepts about e-learning in general. After that, it looks through the 6 components that the e-learning system should consist of. It also lists 7 criteria that should be followed regarding e-learning components and solutions. Next, it deals with a short list of standard rates to guide e-learning application. Finally, it studies an important suggestion which was a conclusion of a case study conducted in Al-Andalus schools in Saudi Arabia. This best-practice study suggests in details how to infuse "project management" when managing e-learning including the benefits gained and the organizational structure recommended with sufficient examples and illustrations.

INTRODUCTION

In this paper, the author endeavors to introduce a model of a best-practice methodology to implement and run a blended e-learning unit or body inside educational organizations. He doesn't claim that this methodology is perfect or complete but it is a step towards the right direction where learners can really benefit and gain through infusing technology in education. This big step is a result of a practical real case study took place in Al-Andalus K12 schools in Saudi Arabia. Al-Andalus schools sponsored a multi-project program called "Masar" managed by the author. The program targeted the four thousands learners and teachers of the Al-Andalus and lasted for two years. The program included enhancing the use of web 2.0 tools in education and its objective was to maximize the use of technology in active learning. (Masar-Tech Bolg, n.d).

CONCEPTS AND DEFINITIONS

Education:

In the suggested model, learning is emphasized over teaching. The term "learning" focuses on interactive education where learner is in the heart of the learning process. On the other hand, the term "teaching" implies one-way negative teaching by the teacher who knows everything (Starke, 2007). E-learning in our model is defined as "the use of modern technologies including the internet to introduce wide-range of solutions to enhance knowledge and performance anywhere, anytime" (Rozenberg, n.d.). In our case, Al-Andalus schools applied a "blended" model of e-learning. That means the use of "distance," off-site learning which depends on the internet and other technologies is implemented in parallel with "face-to-face," on-site learning (Wikipedia, n.d.). For example, a teacher shares a clip about earthquakes on his page on "Facebook" asking students to comment and discuss it a week before their science lesson which deals with the same topic. This enhances learners' knowledge and consolidates their practice inside and outside classes.

Project management:

The author throughout this paper suggests integrating the "project management" techniques when managing e-learning. PMI® "Project Management Institute" was selected to be the scientific reference of project management in this paper for many reasons. PMI® is a non-profit organization dedicated to advancing the project management standards since 1969. It is the world's leading association for the project

management profession. Its main publication “PMBOK®” is a project management guide, and an internationally recognized standard, that provides the fundamentals of project management as they apply to a wide range of projects. PMI accredits some certificates which recognize and evaluate the profession of project management. Most important certificate is “PMP®” which states that the PMP person is qualified to manage projects according to global standards. This certificate is granted for graduate candidates after a series of procedures including documentation of 4500 hours of experience and passing an exam (PMI, 2008).

E-LEARNING MYTHS

To be honest, we can say that worldwide vision regarding e-learning is not mature yet. Technology is changing almost everyday and this affects e-learning practices and theories. The swift emergence of new technologies like "iPhone" or "IP-TV" confuses researchers who are accustomed to take months and years to study how to apply them. Let us for example go back six years, before "web 2.0" social networks appearance, and try to browse our options to connect to others. Now, "Facebook" as one of these networks can make it possible to share a video clip with 500 million people in one second! (DidYouKnow, n.d.) On the other hand, in our community, there is some misunderstanding for the basics of e-learning. We have to be aware not be confused by the following rules when we think about applying e-learning system:

1. E-learning is not necessarily interactive learning. That means if we apply e-learning in our organization we may apply it as an interactive modern style, or we may use it just as another traditional, negative, yet "digital," education. In other words, a teacher can use the email to let learners answer a question or deliver a research for example, and this is not interactive learning. He should let them use the internet to discuss the topic with peers or connect to experts to do their research, and that is interaction.
2. E-learning is not replacement to face-to-face learning. When we expand using technologies in education which consolidate distance learning, traditional classes should not decline. Technology in that case provides support to extra-curriculum activities outside classes but does not substitute an extremely important aspect of human interaction. This real-time human communication is very important, especially for k12 learners, as it covers areas of learning outside the scope of distance learning like values, culture, norms, and physical growth….etc.
3. E-learning model is not isolated fragment inside the organization. E-learning system should be implemented as a part of an integrated structure under a unified vision throughout the whole organization. E-learning is not only some PC's and hardware components, software modules, or some system solutions, but it also covers how we operate them, the objectives of using these components, evaluation and support, the theme beyond choosing them, and many other elements.

MODEL COMPONENTS

In our suggested model, e-learning system consists of the following components (Khan, 2001). This classification is just a virtual one to simplify the topic but we have to consider that they are integrated and correlated with each other. Moreover, they should be implemented as a whole system with a main theme and a unified vision.

Instructional design:

It means the pedagogical theory, teaching methodology, learning strategies, activities assigned, extra-curricula techniques, and other related topics adopted within the organization. These issues are always decided in another department like "Educational Development," "Teaching and Learning," or "Academic Affairs" to mention some. We have to remember that worldwide vision recommends "Active Learning" as a philosophy for teaching. "Active Learning" strategies include, but not limited to, "co-operative learning," "thinking-based learning," "learning by exploring," "problem-solving learning," and "project-based learning” (Starke, 2007). Furthermore, it is important to mention that instructional design should address all aspects of instructional domains; cognitive, psychomotor and affective, and not cognitive only.

Web 2.0 tools:

They refer to the revolution of the internet happened after 2004 when many websites and applications emerged where the user participates in creating the content of the site and interacting with other users. Blogs, Wikis, and social networks are example of these Web 2.0 tools most of which are "open

source." Many of them are either useful for educational needs or specialized for that purpose like: "ClassMarker," "DimDim," "Edumax," and "Schoolr." In figure (4) there is a list of these helpful tools.

Figure (4):examples of Web 2.0 tools that are useful for education.

Content and material:

This means the digital version of the curriculum like presentations, documents, web pages, multimedia streams, and electronic tests. Content can be classified into more than one division. It can be divided into "basic" or "enrichment" content. Also it can be divided into "static" or "dynamic" content. On the other hand, there is interest in "learning objects" which mean separate modules which serve various facts or pieces of knowledge and can be utilized in more than educational situation. (Wikipedia, n.d.)

LMS (learning management system) and authoring tools:

"LMS" is a web-application used to manage learning content among learners and teachers including exams and grades. Most famous applications are "BlackBoard" and "Moodle." (Brandon, Bill & Chuck Holcombe, 2006) "Authoring tools" are programs or application which help teacher to create content and upload it to LMS in a user-friendly interface without any need to learn programming or complicated skills. An examples for Authoring tools is "Wimba Create" (Brandon Hall research, 2009)

PC's, Hardware and related applications:

This includes "Data Show" and projecting tools, computers and operating systems, "PDA's," "Smartboards," printers, lab instruments and applications, "School Management System," and other managerial systems.

Infrastructure and network:

This includes wired or wireless network, internet accessibility and email system. It also contains the main operating system like "Windows server" or "Mac OS."

MODEL CRITERIA

Now we will look through some characteristics we should adhere to when we adopt a new education technology solution or any e-learning component whether a complete system or a division. They can act as an assessment checklist when we are evaluating current state or planning for future enhancement as well.

- Ease of use: The whole system or any part of it should be easy and comfortable for all parties of users including teacher, learner, and management. We have to bear in mind that the basic notion of e-learning is to facilitate and smooth learning and save time and effort. (Wikipedia, n.d.) It is not acceptable then to have a software program for example which is considered as a burden by users. Furthermore, it is not adequate to have less

"return on investment" when using a piece of hardware than we do to operate and maintain it. This criterion includes the neat format of the component, the eye-comfortable graphic design, proper user interface, attraction to the user age and mood, and adequacy to learning situation…etc

- Interaction: Currently teaching methodology emphasizes active learning over traditional, one-way teaching as we mentioned before. Therefore, e-learning system should support and afford interaction among all learning parties. Interaction may come true by discussion, feedback, workgroup, role play, peer review…etc. interaction should address both social and cognitive aspects of the learner.
- Active learning: When we design an electronic solution or implementing a new system, we should consider and employ active learning strategies like thinking-based learning or learning by exploring. For example, when a teacher is going to assign a group of students a research on the internet, he should initiate a project or any form of co-operative learning.
- Diversity: Activities and tasks related to e-learning should be diverse and assorted in every side. Solutions presentation should contain audio-video availability. Knowledge resources should include encyclopedia, websites, experts' opinion, peer discussion, and others. Communication among learning parties should include mobile and SMS features, social networks, emails, and web-based systems. In general, diversity suits individualization and guarantees different interests satisfaction. It also motivates learning and reduces boredom of the learner.
- Learner-based inspiration: Planning to any e-learning component should follow learner needs and expectations. Learners have to be represented in the process of planning and design and every step managing e-learning component. Also the frame of the e-learning activity or task should be relevant to learner's culture or environment and authentic material is used for that purpose. Therefore, learner satisfaction should be a success indicator when evaluating an e-learning component or solution.
- Efficiency and integration: The benefits anticipated from utilizing a certain solution should be worthy of effort and cost spent over implementing it. There should be an appropriate way to measure the outcome of the solution implemented and this measure should relate to learner's needs and expectations and be observed from the very beginning and across the whole management process. Each e-learning component is to be compatible with the entire system and reflect the organization's strategic vision. It is recommended to strictly follow a well-known management methodology or frame every time a solution is adopted like "Project Management," "Balance Score Card," or "Deming cycle" as in figure (1). (Shewhart, Walter Andrew 1980). It is worth mention that this paper recommends "Project management" and suggests a more detailed methodology in a following section.

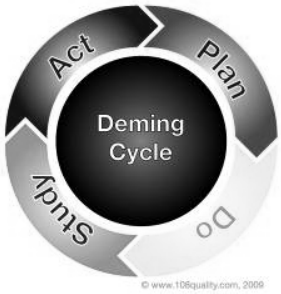

Figure (1): Deming Cycle steps, an example of a well-know management frame can be followed in managing e-learning solutions.

- Support: The component selected should be supportive both financially and technically. There is no point to adopt a modern solution even if it is marvelous and fascinated while the organization can not afford or support it or difficult to be trained on. Support may hold many facets like: users' quantity and geographical coverage, level of security needed, work path among involved parties, compatibility with existing components, local language support, and training packages availability.

MODEL STANDARD RATES

In this section, we glance through per-learner standard rates regarding different elements. It is worth mention that these rates are approximate and needs to be re-calculated according to organization strategic plan and financial level, learners' quantities, level and age of learners, and many other factors.

- Technology expenses: 300$ per learner. (Ted's Blog, n.d.)
- PC technician: 1 per 150 learners. (Becta, n.d.)
- Instructional design technician: 1 per 200 learners. (School Finance Redesign Project, 2007)
- PC server: 2 per 500 learners. (Google savings calculator, n.d.)
- PC's: 5 per learner. (Ted's Blog, n.d.)

PROJECT MANAGEMENT E-LEARNING

Project management versus operational work:

The paper recommends following project management tools and techniques when dealing with e-learning management. "Project Management" can be combined and infused in ordinary "Operational Management" to optimize the outcomes and improve quality. PMBOK® guide (2008) states that projects are different from repeated operational work in that projects are unique temporarily effort to produce a certain deliverable within time, cost, resources and quality constraints. The project is complete when its objective is fulfilled and requirements are met. Unlike projects, operational work repeats itself over time and does not terminate when its current objectives are met.

On the other hand, both operational work and projects can interact between each other in many aspects. For example, when a new solution in the Organization is developed to satisfy the learners' needs, a project is initiated with resources from different departments to research learners' preferences, select best alternative, test it, and deliver the solution to an operational department. This operational department keeps producing and supporting the solution for the learners.

Benefits of infusing project management:

Infusing project management in E-learning implementations results in many benefits which are lost when managing them only as operational work. These benefits include:

Objective-based activities: most of the tasks will be measured against project objective and effort will be optimized. Tasks will be prioritized according to their impact on project overall objective and hence unnecessary time and cost will be saved.

Skilfulness and development of team members: some of the project management HR processes concentrate on the development and management of resources. Moreover, transference of knowledge is assured if we bear in mind the idea of assembling a temporary team consisting of different experiences from different departments of the organization and even representatives from the customers and vendors working through a communication plan.

Requirements-driven implementation: according to PMI® standards, a process of collecting requirements is conducted at the very beginning of the project. Metrics are developed based on these requirements and the whole scope of work is monitored and controlled through these metrics to ensure that the output is done as required by the end user and only the required work is done. As a result, the proper technological tool will be chosen and used for what it is needed for, not for what it offers.

Quality-focus performance: when planning for the project, risks are early identified and various indicators and measurements are developed to help monitor work achieved towards the success of the project. Different risks responses and corrective actions are to be implemented to keep the performance on the track.

Organization chart:

Accordingly, the suggested "organizational chart" of the e-learning department would be different from ordinary one. In the ordinary wide-spread model, as represented in figure (2), you can find an e-learning management department or unit whose technicians present and support different solutions to the final users, learners and teachers. These technicians are professional IT people but do not have enough experience with pedagogy and teaching profession.

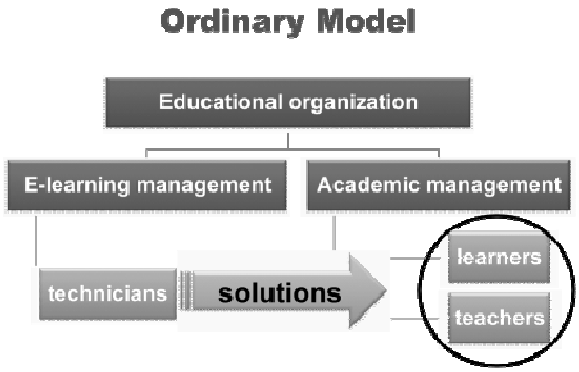

Figure (2): representation of the ordinary organizational chart regarding e-learning management.

On the other hand, the suggested organizational chart is a mixture between operational ordinary model and project management structure as represented in figure (3). The IT employees work as consultant in the field of technology with good background in teaching. The learning parties, teachers or learners or any others, along with e-learning consultant work as one team in the project. Each project deals with a solution or component with its own objective. The project manager could be different each time according to the project objective. For instance, in our case study in Al-Andalus school, a teacher was the project manager in one project and a student was the project manager in another case.

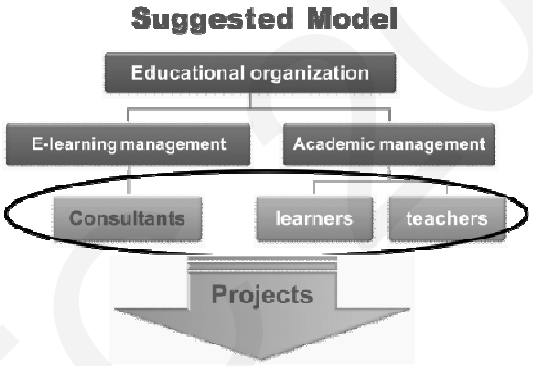

Figure (3): representation of the suggested organizational chart regarding e-learning management.

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ELECTRONIC TEXTBOOK AND ITS DIDACTIC AND METHODICAL VALUES

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ABSTRACT:

The object of our interest is the electronic textbook, as a scenario of the process of learning and acquiring knowledge, based on certain didactic and methodical values which enable desirable approach to education, upbringing, learning and student development. Textbook is being considered from theoretical and empirical aspect. In theoretical relations the answers to the questions of the essence of the electronic textbook and those didactic and methodical values that make it an appealing and useful school book are being searched for. In empirical context 7 groups of established didactic and methodical values in the Nature and Society electronic textbook are being considered.

***Key words**: electronic textbook, didactic and methodical values of the textbook, Serbian teachers` attitudes*

1. THEORETICAL CONTEXT OF RESEARCH

In order to define an unknown or a less known concept, it is necessary to uncover its basic, essential characteristics, which necessarily and specifically (in regards to the others) characterize it. It is important to determine the specific difference in regards to a closer and the first superior concept in the conceptual hierarchy to which the defined concept belongs. What is an electronic book, what it stands for, what is its basic function and purpose, are some of the questions to which clear and complete answers are needed in attempt to totally determine it.

The existing definitions of electronic book wander among two basic standpoints. One is connected to the complete hardware and software technology upon which the e-book functions, and the other solely to the content it brings. The protagonists of the first standpoint Lynch (2001), Hillesund (2001), Sawer (2002) emphasize a greater significance of the reviewing technology than the content of e-book. However, Pace (2004: 74) establishes the fact that "technology without a good content is only form without essence". The same standpoint was taken by Cox and Mohammed (2001), adding that e-book is a digital text visible on the computer screen (here the device for reviewing e-books, so called e-reader, is not taken into consideration). McKnight and Dearnley (2003:235) were more precise, defining e-book as "the content of a published book available to readers in e-form".

The fact is that technical and technological development is drastically ascending, that it is difficult to connect any definitions, determinations to the particular, changing process, thereby essential terminological determinations of the e-book are connected to their transmitters, the media which are in the constant process

of changing and improvement. Therefore the need to accentuate the content of the electronic book, and not the technology which supports its functioning.
However, another important issue is imposed here – the issue of quality, the content of e-book. Previously "published books" in the printed format mainly consisted and are still consisted of textual forms and pictorial images. That would denote that e-book, by definition of McKnight and Dearnley (2003) excludes other media content – audio, audio-visual, multimedia presentations, that cannot be acceptable. Moreover, the book is not required to be previously published to gain the characteristics of an electronic book.
In distinction from printed classic issue, mostly linear, e-book also has other options. Electronic publishing allows hipertextual network structure of the content which supports and imitates mental structures and mechanisms of those who teach, as well as those who study.
In attempt to define e-book as precisely as possible Anderson-Inman and Horney (1999) established basic criteria of its defining: 1) an electronic book must have electronic text, which must be presented to the reader visually; 2) the software must adopt the metaphor of a book in some significant way; 3) the software has to have a focus or an organizing theme; 4) when media other than text are available, they are primarily used to support or enhance the text.
In this connection, more acceptable are those definitions of e-book that rely on "book-like" content available in electronic format.
So far we have stated some of the specific differences between the classic and e-book. That list should be completed by certain advantages of electronic publishing: easier delivery of content and better availability to the aim user group (there are no time or space limitations), interactivity between author-content-reader-editing (faster return information on content quality, understanding, critical evaluation...), less cost of production and delivery... The thing that binds together the printed and the electronic issue of the book is their primary purpose, function, goal. And the goal is the end user, reader, the one who mentally interprets the offered content with the intention of understanding the message of the author, thus incorporating it in his own value system. The fact is that the classic book has its advantages in regards to its identical electronic form, but we are focused solely to the definition of e-book, so we are not going to deal with those advantages and restrictions in detail.
Here we ought to remind that the concept is the thought on the essence of what we think about, that means that the concept of electronic book is the thought of its most important, essential characteristics that in so many ways differ from the printed book. The facts are that electronic book is CURRENTLY:

- available in two formats – 1) on a personal computer, laptop or handheld computers with certain software support for reading e-books and 2) electronic readers – special devices with the primary purpose, according to its name, is reading e-books;
- it operates with the adequate hardware and software support;
- materialized in electronic, digital portable form;
- formed of more media content (from textual to multimedia), that can be linear and hyper textual.

Is it possible to give essential, logical definition of a certain concept if its definition is limited by the time category? Certainly the answer is negative. Therefore, it is perhaps the most acceptable general definition: e-book is an electronic book-like multimedia and dynamic content subject to constant changes. Knowing that, supporting the protagonists of the other standpoint who give advantage to the content of the defined form, another (didactic and methodical) approach to definition of the notion of electronic textbook is going to be used here.
All the characteristics of the e-book can be attributed to the e-book, for it is its subgroup with certain and very important qualities.
The place of the electronic textbook in the Act on the basis of education and upbringing in Serbia is not especially determined. Electronic textbooks are not included in detail in the Regulations on the standards of quality, nor does one standard refer solely to them. The same standard and indicators stand for them as for the printed textbooks. Special indicator is given only for supplementary didactic material in electronic form (CD, DVD, etc.).
At the beginning of the twentieth century N.K. Krupskaya (1974) makes a standpoint that a textbook must be well thought of and pedagogically developed material that will be used by the teacher and students. Krupskaya points out several fundamental values of the textbook, without which complete definition of the

contemporary textbook could not be imagined, the emphasis is on: the scientific foundation of the textbook, adjusting the knowledge to practice, adequate cognitive, self-educational and systematic basis of the textbook.
At the International Publishers` Conference in Moscow in 1986, the Polish Jerzy Lozinski and Helena Pawkovska (1986) concluded that the discussion on a textbook and its function must be based on contemporary educational orientation, new school objectives, especially those connected to gradual and planned activity of getting the habit of permanent education for students, most efficiently accomplished in the process of self-education and students` quality of knowledge, as the results of these processes.
In his study Problemy sovremennoj didaktiki, M.N. Skatkin (1980) states that the textbook is not a simple collection of knowledge, it is not a manual for a certain special science, but a wholesome scenario for the future learning process, a scenario based on pedagogical demands, goals of general education, capabilities of students and the rules of the teaching process. The textbook must guide mutually connected activity of teachers and students in the process of learning and provide realization of its three primary functions: education, upbringing and development.
The textbook is, on one hand, a source of knowledge – the bearer of the content of education and aspects of activities of knowledge adoption and, on the other hand, the textbook appears to be an important learning device. Thus understood textbook should accomplish more pedagogical functions in the learning process: informational, transformational, systematization, consolidation and self-control, self-educational, integration, coordination and upbringing (Zujev, 1988, Khabib, 1978, Burov, 1983). Vicenty Okon comprehends textbook closely related with the four learning processes: adoption, repetition, discovery and activity and he attaches them four corresponding functions: informative (logical side – subject and psychological systematization), researching (independence in finding solutions), transformational (the choice of necessary procedures and methods for practical actions) and self-educational (creating cognitive needs and interests).
Considering the tempo of changes in the world, four times faster than the changes in contemporary school, the textbook cease to be a bound content used by teacher to teach and by student to acquire knowledge, but becomes a collection of content aimed at a wide range of students` abilities (understanding and thinking, the speed of learning, managing to find information and new knowledge, learning to learn...) and personal qualities (self-esteem, self-respect, patience, belief in the power of knowledge...) that will be used by contemporary students in changing the world of tomorrow (Žužul and Vican, 2005: 54).
It must not be forgotten, that textbook in the process of education and upbringing, appears to be a device in education of future generations and the material used to study understanding of inner self as people. The message society would like to send to the upcoming generations is always important for itself, for it is the best description of the society it would like to become (Šisler 2004: 19). Besides denoting the process of education and upbringing in the qualitative way, a textbook is multifunctional in character, in the sense of transferring certain cultural achievements onto younger generations, supporting students in intellectual work, development of critical and research spirit, in general sense – development of book using culture (Milić, 2010: 151).
All the definitions and functions of a textbook stand for electronic textbook as well. It must be a well thought of scientific and pedagogic material aimed at moving students` creative powers and his planned getting used to independent work, a scenario for the future learning process based on pedagogical requirements and goals of general education. An electronic textbook must be the bearer of aspects of activities in knowledge acquisition, it is the materialized activity of a student and proposed activity of a teacher, an electronic textbook is a book with accessibly presented different multimedial contents, electronic textbook is cultural, sociological, pedagogic and psychological problem. For the electronic textbook to be an optimal scenario of the future learning process, it must be well didactically and methodically formed, that means based on the rules of the teaching process, learning process and general rules of student development.
These requirements significantly point attention to essential values of electronic textbook.
The values of electronic textbook are various, for they are dependent on: a) good basic science knowledge of the subject for which the electronic textbook is created; b) good knowledge of the rules teaching process on which foundations is the whole student activity based; c) good knowledge rules learning process; d) knowledge rules certain age child development (Laketa, 1999: 71). Through analysis of various opinions on the notion of textbook and, from those derived values known to pedagogic theory and practice, a unique list of didactic and methodical values was created and their verification designed on the Nature and Society electronic textbook.
Our list of didactic and methodical values of e-textbooks, in regards to structure, is consisted of seven mutually separated wholes. They are: informational, cognitive, systematization, self-educational, coordinating

and interactive values. *Informational values* enable content dimension and presentation; including: information coordination with the subject teaching programme according to volume, sequence and depth; the way of content presentation including information, description, explanation and problem tasks; language and stylistic values, sentence complexity and clearness, terminology conformation to age, text saturation with information degree. *Cognitive values*, as a foundation for discovering the most desirable comprehension ways, include: concept formation based on students` foreknowledge and experience; concept formation course, from special to general and general to special; logic errors in deduction, deduction based upon insufficient number of examples, incompatibility of the cognitive process with students` intellectual capabilities; the course of developing connections between the given notions; use of acquired knowledge in practice; the nature of problem situations and the way of finding hidden truths. *Systematization values* enable connection in content presentation, and are consisted of: textbook chapters as special content units; chapter structure, introductory, main and final part; conclusions, in chapters, units and at the end of the textbook; addressing students; questions, tasks and subject summary. *Individualization values* are in purpose of adjustment of the presumed learning process to the actual students` capabilities, especially with their capabilities, levels of knowledge and interests. *Self-educational values* stimulate and enable students for independent work and independent knowledge acquisition, comply: development of students` skills to notice the important, make plans and control their own work and apply the learned in practice; encouraging and enabling students to partial research work and correct use of textbook. *Coordinating values* enable leading (integration), role of electronic textbook in the sources of knowledge system, textual, visual, auditive and audio-visual, multimedial. *Interactive values* of the textbook enable interaction between textbook content and students, student is informed on what is compulsory to learn, what he can choose to learn, there is an opportunity to check the accuracy of solutions, make problem questions and tasks and give new examples.

METHODOLOGY CONTEXT OF RESEARCH

Theoretical research context focused our attention to electronic textbook, particularly (the subject of our research) to didactic and methodical values of electronic Nature and Society textbook used in primary schools in Serbia. The aim is to examine the attitudes and opinions of teachers, the most competent experts in this field, on seven didactic and methodical values of e-textbook and evaluate on those becoming and to what extent an integral part of this contemporary source of knowledge and student development factors. From the established aim the following tasks derived: 1) to examine general attitudes of teachers on didactic and methodical values of e-book; 2) establish teachers` assessment on all the didactic and methodical values of e-textbook, especially: a) informational, b) cognitive, c) systematisational, d) individualization values, e) self-educational, f) coordinating (integrative) and g) interactive, in order to receive a return information on the extent of their creation of this type of textbook.

Based upon the research subject, aim and tasks, the principal scientific and research hypothesis and 4 subordinate hypotheses were formed. The main hypothesis is: 1. *Didactic and methodical values of the textbook are an integral part of the Nature and Science e-textbook, and the subordinate: H1: teachers have different opinions, positive, negative and neutral on didactic and methodical values of e-textbook; H2: Didactic and methodical values (7) are not equally represented in the existing Nature and Society e-textbook; H3: There is a significant statistic difference between the attitudes and opinions of teachers with different levels of education; H4: There is a significant statistic difference in the evaluation of didactic and methodical values of e-textbook between teachers of different sexes and work experience.*

The research was based on the application of descriptive scientific-research method with all its modalities, including analysis, comparison and generalization. In regards to techniques and measuring instruments Likert five-grade scale on opinions of textbook didactic and methodical values was used. All the values in the scale were marked as positive statements, and teachers gave opinions freely: strongly agree, agree, (positive response), neither agree nor disagree (neutral response), disagree, strongly disagree (negative response).

The research was performed in September 2010 randomly on 470 teachers in the five counties of Western Serbia. The research variables are: level of education (high school, junior college, university), sex (male and female) and teachers` work experience (up to 10 years, 11 to 30 years, 31 to 40 years of work experience).

The results were processed using SPSS software. Hypotheses' testing was performed using chi-square test.

RESEARCH RESULTS

Due to the limitations of the scope of paper, only the more important research results are presented, without discussion, including the list of didactic and methodical values:

1. On the whole, didactic and methodical values have significantly become an integral part of the Nature and Society electronic textbook, thus confirming the main scientific and research hypothesis of our research.

2. There is a significant statistic difference, at the importance level 0.01, between teachers` attitudes on didactic and methodical values of e-textbook. It was determined that more than a half of the teachers have positive attitude or 50.7%, neutral-less than one fifth or 18.11% and negative between one and two fifths or 31.17% of teachers (see *Table)*. This confirmed H1 subordinate hypothesis.

Table: Teachers` attitudes on 7 groups of didactic and methodical values of e-textbook of nature and society

Teachers` attitudes on didactic-methodical values of e-textbooks	POSITIVE ATTITUDE			NEUTRAL ATTITUDE	NEGATIVE ATTITUDE		
	Strongly agree	Agree	TOTAL	Neither agree nor disagree	Disagree	Strongly disagree	TOTAL
Informational values	11,9%	38,2%	50,1%	23,6%	13,3%	13%	26,3%
Cognitive values	16,9%	31,4%	48,3%	22,7%	13,8%	15,2%	29%
Systematization values	28,9%	30,1%	59%	16,5%	9,9%	14,6%	24,5%
Individualization values	9,5%	24,9%	34,4%	13,7%	23,3%	28,6%	51,9%
Self-educational values	7,4%	20,3%	27,7%	12,4%	17,3%	42,6%	59,9%
Coordinating values	27,2%	44%	71,2%	18,5%	6,5%	3,8%	10,3%
Interactive values	20,3%	44%	64,3%	19,4%	7,8%	8,5%	16,3%
Σ	50,71%			18,11%	31,17%		

The research showed, as it was supposed (H2), that all the groups of didactic and methodical values are not equally incorporated in the Nature and Society electronic textbook. According to teachers, the most represented are coordinating values (71.2%) and interactive values (64.3%), followed by the values of systematization (59%), informational values (50.1%) and cognitive values (48.3%). However, more than a half of teachers evaluated negatively the self-educational values (59.9%) and values of individualisation (51.9%). That means, that the greatest shortcomings of electronic textbook is the lack of didactic and methodical values necessary for enabling students for self-education and self-development, and adjusting the content to actual characteristics of the students. Further analysis of research results reveals interesting structural elements in regards to specific value groups ($X^2=24.403$ $df=12$ $p<0,01$).

4. The educational level of teachers (X3) did not have a significant influence to the research results, except the case of individualization and self-educational values. It was determined that having higher educational level teachers tend to be more critical in evaluation of these values of e-textbooks. The results are significant at level 0.05 ($X^2=20.080$ $df=8$).

5. Sex and work experience of teachers (X4) did not influence the final research results on either level of statistic significance ($X^2=8.645$ $df=8$).

CONCLUSION

Electronic textbook, as a designed and created scenario of a proposed learning process and student development, is based upon didactic and methodical values making it reliable and attractive source of knowledge. Those are: informational, cognitive, systematization, individualization, self-educational, coordinating and interactive values.

The research implies the need for creating an electronic textbook of higher quality, especially in respect to development of self-educational and individualization values.

Although some didactic and methodical values of Nature and Society e-textbook (coordinating and interactive) were highly evaluated by the teachers that does not mean they should not be further improved.

It should be pointed out that there is no ideal textbook, but it should be constantly engaged, theoretically and practically, in creating a textbook of more quality. That is achieved only by team work of creative experts of different professions responsible for desirable hardware and software functioning of e-textbook. A

contemporary digital textbook is an open and dynamic system, constantly subjected to evaluation, critique and improvement.

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EMA-4-MOODLE – AN INTERNATIONAL PROJECT PROMOTING FOREIGN LANGUAGE LEARNING AND INTERCULTURAL COMMUNICATION

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Abstract
Six universities created multimedia online language courses in German, French, Russia and Slovak on the platform of the free open source Learning Management System Moodle. The aim of this project is to facilitate international mobility for European and non-European students by offering them language skills and intercultural know-how. The course scenarios shown in videos and exercises should help realising beforehand social, cultural, situational and individual aspects in the foreign country. A template is offering a standardized lesson structure which allows teachers and/or course developers to create their own language course. The template with a user and installation guide and the German course are available in the www. The project was financed by the European Commission via the Executive Agency for Culture, Education and Audiovisual.

Introduction
Businesses want employees to have international experience, administrations want their civil servants to communicate in an European context and institutions of higher learning encourage their students to study abroad. We live on a multicultural continent and Europeans have recognized the importance of other cultures. They are no longer a source of conflict but a cornucopia of knowledge and wisdom. Recognizing and accepting our multicultural continent is a first and important step on the way to greater European cohesion, but it is not sufficient. Our multicultural world requires more intercultural communication. We need more than a side by side of different cultures. What we want is a fruitful exchange among cultures and nations. It is the aim of EMA-4-MOODLE, an Erasmus Mundus Project to promote such positive communication.

The Project
There are six institutions taking part in this project:

- Telecom Bretagne, Brest (France),
- Hochschule für Telekommunikation, Leipzig (Germany),
- The Bonch-Bruevich St. Petersburg State University of Telecommunications (Russia),
- University of Žilina (Slovakia),
- Telekom Lille1 (France),
- Siberian State University of Telecommunications and Informatics, Novosibirsk (Russia).

The consortium members have had an ongoing partnership in organizing exchanges for students and staff for language courses, symposia and practical training periods. The six consortium members consider that in today's mobile world lack of foreign language skills and intercultural know-how represent the greatest difficulty that students encounter when confronting a new study environment.
The aim of our project is to facilitate international mobility for European and non-European students by offering them tools that will help them overcome these difficulties. These tools are specifically adapted online language courses and intercultural documents. We are developing four language courses: in French, German, Russian and Slovak. We are essentially targeting at students going to a partner institution, but we also expect that other personnel such as teachers or administrative staff could benefit from the language courses which would be helpful for example in preparing for short term visits to partner countries.
The intercultural communication part of the courses is an online attempt to get students to think about cultural differences. The students are offered some information about the country and culture they are

entering and are suggested ways of overcoming differences which might at first sight appear insurmountable. The course activities contain intercultural dilemmas and there are no right or wrong answers, only different points of view. The subjects treated are pertinent to students coming to study and facilitate their quick adaptation to a new environment.
The project is financed by the European Commission via the Executive Agency for Culture, Education and Audiovisual. The project has lasted two and a half years, but we foresee a continuation of the work on the subject after the official end in May 2011. There are indeed many interesting aspects of our work that could well be the subject of further projects.

The Template
Courses will be made available to students and other university users via the Moodle platform. Moodle is a free open source Learning Management System (LMS) which is easy to manage and use. In order to help both, teachers and course developers, as well as student users a Moodle language lesson template has been created. The language and intercultural communication exercises are based on the large variety of didactic activities available within the Moodle system such as description, essay, matching, embedded answers (cloze), multiple choices, short answers, true/ false, crossword, cryptext.
The language course structure contains a course introduction and 10 learning units or lessons. Each learning unit contains an introduction to the unit, linguistic and intercultural input as well as numerous exercises where the student can practice and develop his/her skills and knowledge. Each unit finishes with a review section and a final test where the student can see whether s/he masters the contents of the unit.
The template and a user and installation guide are available under http://recherche.telecom-bretagne.eu/ema4moodle/ and can be downloaded from there. This template facilitates course creation and course use by offering a standardized lesson structure which allows teachers and/or course developers to create their own language course.

The Courses
Students can benefit from the courses and intercultural materials either at their home institution before they leave or after their arrival at the new residence.
The language courses are based on videos. The videos are provided with the subtitles in German and English languages. They give the opportunity to choose the subject/the role, which the students will adopt abroad. In addition the user will be provided with the necessary vocabulary, expressions, grammar etc. and will learn about the foreign culture.
Each lesson includes also audio, grammar and phonetic materials, reading comprehension, listening comprehension, writing, speaking and intercultural communication activities. It also contains some games, a final test and a glossary.

The German Course
The content for the language course was chosen regarding the survey and the problems of foreign students after their arrival in Germany and at German universities. The online language course should help diminishing the differences between expectations and reality in Germany. It is specifically adapted to the needs of the international students and other persons coming to Germany and especially to the HfT Leipzig.
Due to the fact that the target group had already attained a language certificate, the online language course was designed for German language students on various levels (A1 to B2). The course offers the students 10 lessons of about 2.5 hours work each. The development of the language course was based on the template.
The scenarios shown in the videos and exercises should help realising beforehand social, cultural, situational and individual aspects in the foreign country.
It is the aim of the language course to train intercultural competencies for a daily life in Germany. In addition to this, the course also teaches technical terms, which are necessary for the studies of communication technologies and engineering. The technical terms are explained in different publications within the course. You can test the German language course on the website http://moodle.hft-leipzig.de/.

Long-term Exploitation
Nowadays, more and more young people use smartphones for their entertainment. Therefore in future we plan to offer the Moodle language course as a „course to go“. We will make the video- and audio-files downloadable for mobile devices and create offline-exercises for downloading for areas, in which there is not enough data transfer rate available for the videos and audio files.

The German Course is free for every interested student of the German language all over the world. The online course is available for distance learning and without any access restriction.

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EMBRACING COMPLEXITY AND TECHNOLOGY: DEVELOPING A LIFE-LONG LEARNING MODEL FOR ADULTS WITH AUTISM SPECTRUM DISORDERS IN NON-WORKING TIME AT INTERDEPENDENT HOME

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ABSTRACT

The purpose of the study was to employ complexity theory as a theoretical framework and technology as a facilitation technique to develop a life- long learning model in non-working time at interdependent home for adults with Autism Spectrum Disorders (ASD). Medical and support teams, adults with autism and their families were interviewed, observed and analyzed to develop the model during four short-stays from July 2009 to December 2010. Data were analyzed using constant comparison through application of QSR Nvivo 7. This study identified four key elements for developing a viable life-long learning model through technology in non-working time at interdependent home for adults with ASD to adapt the impact of aging society, to improve quality of medical services and to enhance the quality of life for medical teams, patients and their families. The study also found that the model is able to assist medical teams to avoid burnout, to learn leisure and relaxation, to release stress and to enhance life-long learning for medical teams and caregivers/families.

Keywords: Keyword: interdependent home, autism, complexity, quality of life

INTRODUCTION

Past research identified that raising adults with ASD can be stressful and confers exceptional challenges on caregivers (Baker, Hartley, Seltzer, Floyd, Greenberg & Orsmond, 2011; Smith, Jinkuk, Seltzer, Greenberg, Almeida & Bishop, 2010). The challenges are difficult to overcome because the nature of core symptoms of ASD, which include impairments in communication and reciprocal social interaction, and the presences of restricted and repetitive behaviors and interests (American Psychiatric Association, 2000). Therefore, developing long-term care services for adults with ASD is one of the most crucial issues for the autism community. Chiang, Lee, Frey, & McCormick (2004) used a videogame-based intervention to improve the quality of friendship on individuals with ASD and found positive impacts on several components of friendship quality, peer recognition through physical competence, and social expectations among participants. Related studies also echo the study and point out that technology is a potential addition to enhance the quality of learning motivation for individuals with ASD (Narkon, Wells & Segal, 2011).

Non-working Time at Interdependent Home

Lu, Chiang and Wang (2008) pointed out that interdependent home can create a happier and friendlier environment for people with disabilities. The concept of interdependent home is the "mixed" care system between professional/organizational facility and home-based care. In order to have good quality of care, professionals from health care/education/social worker assist to support the interdependent home that is set up primarily based on parents. Parents who have children with ASD will take turns to play the parents of the interdependent home and take care of 3~10 adults with ASD. However, the study also points out that there is still a lack of human resources in interdependent home, especially during non-working time and days (e.g. weekends, holiday, summer and winter vacations, …etc.) With the diverse interests and disabilities, adults with ASD have complex situations to construct a life-long learning environment in interdependent home. Since complexity theory has been pervasively applied in numerous research and practice to adapt multiple environmental changes and multidisciplinary collaboration in both natural and social sciences. McConnell, Lekan-Rutledge, Nevidjon & Anderson (2004) point out that this theory is valuable for long-term care settings to adapt complex situations. As a result, the purpose of the study attempts to employ complexity theory as a theoretical framework and technology as a facilitation technique to develop a life-long learning model in non-working time at interdependent home for adults with ASD.

METHODS AND PROCEDURES

FACT Short Stays

The study cooperated with the first five-year "Shining Star Sustainable Action Project" of the ROC Foundation for Autistic Children and Adults in Taiwan (FACT) and recruited members and staff in FACT and the medical team in Hualian Yuli Veteran Hospital (HYVH) as the service team. The goals of the "Shining Star Sustainable Action Project" are: (1) initiative collaboration between FACT and HYVH; (2) Designing an autism-centered long-term care program with the concept of home rebuild; and (3) Developing a multidisciplinary holistic care program by combining medicine, nursing, psychology and counseling, social work, and occupational therapy. The FACT and HYVH has been initiated and signed the collaborative memorandum of understanding (MOU) on July 20, 2006 and signed the second MOU on November 25, 2008. The project began to run the first short stay at July 20~31, 2009. According to the condition of participants, the other 3 short stays were held at October 19~30 in 2009, May 3~15 and November 8~December 31 in 2010.

Participants

Medical and support teams, adults with autism and their families were interviewed, observed and analyzed to develop the model during four short-stays from July 2009 to December 2010. The medical team members included the superintendent and a psychiatric doctor, one head nurse, two clinic counselors, one social worker, and two occupational therapists from HYVH. Support team members are two teachers and three social workers from FACT. The first stays recruited 8 adults with autism and some of their parents to participate. With screening process, the number of participants decreased to three individuals at

the forth stay. All participants in this project were interviewed and observed when they were available during those stays.

Method

Two qualitative research methods, participant field observation and informal conversations, were used to collect responses and feedback as field notes from adults with autism and their family members, medical team members, and support team members in this study. All data were gathered and analyzed by researchers who have previous qualitative research experience and prior experience working with autism populations. Member checking, peer debriefing and auditing are three main procedures to enhance the trustworthiness, credibility and transferability of the study. The QSR Nvivo 7 Software Package was used to assist in coding, sorting and generating themes of the data.

Theoretical Framework: Complexity Theory

Paley (2007) states that complexity theory has been pervasively applied in a variety of professions to adapt multiple environmental changes and multidisciplinary collaboration in recently research. Evolved from Chaos theory and Lorenz attractor (figure 1), complexity theory that emphasizes uncertainty and randomness constructs a non-linear dynamic system that traditional organizational theories are inability to explain and predict. In the healthcare and education literature, there is a growing attention in complexity theory and its implications. For example, there are a variety of research and professions that using complexity theory as the theoretical framework to construct their studies, such as medical education (Fraser & Greenhalgh, 2001; Rees & Richards, 2004), health promotion (Wilson & Holt, 2001), shared care for patients with long-term mental illness (Byng & Jones, 2004), and healthcare management (Plsek and Wilson, 2001).

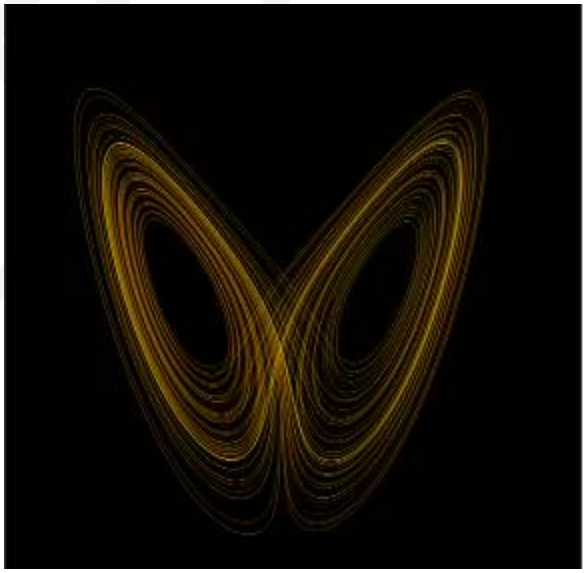

Figure 1. An icon of chaos theory - the Lorenz atractor (Source from Wiki Foundation, http://en.wikipedia.org/wiki/ File:Lorenz_attractor_yb.svg)

Complexity theory has the strength when being used to explain the survivability and adaptability of

systems that need paradoxical explanations (Grobman, 2005). The theory provides a graphical framework that creates a complex zone with appropriate degree of agreement and certainty between simple and chaotic situation (figure 2). In this study, we use it as theoretical framework to construct a life- long learning model in non-working time at interdependent home for adults with ASD.

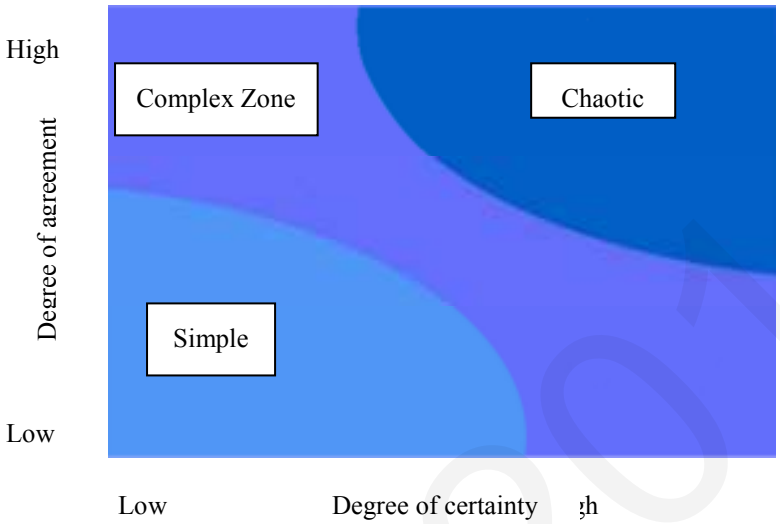

Figure 2. A graphic framework of complexity theory (Adapted from Plsek & Greenhalgh, 2001)

RESULTS

This study identified four key elements which include mutual adaptation, co-evolution, dynamic interaction and self-organization for developing a viable life-long learning model through technology in non-working time at interdependent home for adults with ASD to adapt the impact of aging society, to improve quality of medical services and to enhance the quality of life for medical teams, patients and their families.

Mutual Adaptation

According to complexity theory, mutual-adaptation points out that multidisciplinary cooperation and discussion is extremely important for facilitating adults with ASD a diverse life-long learning environment. Traditionally, professional teams who serve adults with ASD are from medical, nursing, special education, physical and occupational therapy and social worker. All of those professionals do not have trainings on facilitating leisure, recreation, sports and other life-long learning activities during non-working time. Therefore, the model suggests that mutual adaptation shall be promoted to those professionals who serve adults with ASD. For example, higher educators in those professionals are recommended to revise their curriculum and add more technology-based courses (e.g., e-learning) in their professional development and trainings.

Co-Evolution

The study found that both FACT and HYVH have to expand their concepts on their service spectrum

for adults with ASD in interdependent home, such as learning time (e.g., after school hour, midnight, early morning), learning style (e.g., needing a great amount of multimedia to keep concentration), feedback (online electronic interaction), and motivation (e.g., computer attachment, video-/audio-information). This theme identified that organizations have to co-evolve their services and innovations on technology-based learning when there is a lack of human resources during non-working time.

Dynamic Interaction

Dynamic interaction addresses on the importance of increasing interactions between organizations, professionals, and adults with ASD. For example, the FACT and HYVH have to gather possible solutions to develop potential arrangements for adults with ASD and their parents in non-working time at interdependent home since it is a home-based long-term care model. Therefore, interactions like family members are highly recommended and technology, definitely, is a crucial part during the interaction process. The immediate communication via technology is suggested, such as Facebook, Plurk, Twitter, Blog, MSN and Skype.

Self-Organization

Self-organization strongly recommends that service providers (e.g. FACT and HYVH) and parents support groups shall start to advocate and develop non-working time leisure and recreation programs. The concept of self-organization not only provides non-working time leisure and recreation for adults with ASD, but also gives a window for medical team members to avoid burnout, to learn relaxation and to perceive fun and enjoyment during their services. Therefore, continuing leisure education programs are identified as an important component for their self-organizations.

DISSCUSSION

The study also found that the model is able to assist medical teams to avoid burnout, to learn leisure and relaxation, to release stress and to enhance life-long learning for medical teams and caregivers/families. Several matters arising from the research methodology may have impacted on our final results. The lack of directly empirical data to support the model may be criticized due to the nature of exploratory study design. However, with solid theoretical framework support and critical literature review, the study still provides valuable contributions to stipulate possible practical solutions for non-working time and services at interdependent homes. Another potential challenge would question on the legitimacy of borrowing concepts of complexity theory as a metaphors from the physical and biological sciences. In order to overcome this challenge, a great amount of previous studies on complexity theory have been critically reviewed and satisfactory in predicting solutions on multidisciplinary collaborations because complexity theory is a new view of looking at how complex environment, structures form, adapt, and change. The academic nature of the research was emphasized in this study.

CONCLUSIONS

Paley (2007) states that applying complexity theory in health care service and health related

organizations is a right approach, however, it is believed that this approach is still the embryonic state of the complexity science development. Using complexity theory as a theoretical framework, the study found that this technology-based life-long learning model is able to assist medical teams to avoid burnout, to learn leisure and relaxation, to release stress and to enhance life-long learning for medical teams and caregivers/families in non-working time at the interdependent home.

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EMPOWERING TEACHING AND LEARNING OF GEOGRAPHY BY USING WEB-BASED GIS APPLICATION AS A TEACHING TOOL

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ABSTRACT

The paper presents a study on the potentials of web-based GIS application as a tool in teaching Geography in the lower secondary schools in Malaysia. The objectives of this study are to identify the features and components of the current web-based GIS application and to suggest ways on how it can be utilized to aid the teaching of Geography in lower secondary school. These two are combined to produce an innovative method in teaching Geography subject. Content analysis is the main method used to achieve these objectives. Findings show that it is possible to introduce and apply web-based GIS application such as GoogleMap and Wikimapia with curriculum set for Geography lessons in Malaysian lower secondary schools. The availability of technological advances on the internet has widened the possibility of integrating spatial knowledge into the current curriculum. In addition, web-based GIS maps are easily and freely available on the internet. This will further enhance students' learning capabilities.

Keywords: web-based GIS, online maps, Geography subject curriculum, internet.

INTRODUCTION

Technological advances have changed the ways things are done today and those who are not able to take up the challenges will be left behind and miss the benefits that these opportunities can offer. Information and communication technology or better known as ICT has been widely used in Malaysia since the 1970s (Lateh Habibah & Vasugiammai, 2010). However, it was not used in schools until late 1990s. Since then, projects such as Smart School, Projek Pengkomputeran Sekolah and School Resource Center emerged. Malaysian Government sees the importance of incorporating ICT in the curriculum and allocated RM5 billion budgets for a 7 years period from 2003 until 2010 for the Malaysian Ministry of Education to upgrade computer literacy and ICT among the younger generations (MOE, 2003)(cited in Lateh & Vasugiammai, 2010). In 1995, the only subjects that incorporated the use of computers in their curriculums were Bahasa Melayu, English, Science and Mathematics. In view of the importance of ICT, the computer literacy was included as a subject Malaysian Education Curriculum in 1996 (Gani et al., 2006). In addition, Malaysia government has further initiated one computer one family campaign to encourage the people to own a computer and stimulate government intention to increase the number of computer literacy among its citizens. Furthermore, tax deductions is also provided for those who purchase computers (LHDN, 2011). This has been practiced since the year 2003. In addition, starting this year, in order to encourage the citizens to obtain internet access, Malaysian government also provides tax

deductions for those who subscribe to broadband services. Currently the number of internet subscribers in Malaysia is more than 17 million people (Internet World Stats, 2011).

Online and Web-Based Geographic Information System (Web-based GIS) Maps

Online and web-based geographic information systems or better known as web-based GIS maps are related map applications. On one hand, online maps can be standard digital maps published on a web browser and at the same time they can be represented by web-based GIS maps. On the other hand, online maps can also be published as digital maps that do not have any geographic information systems (GIS) features at all. Kraak (2001) views online maps as digital maps published on web browsers. Represented by two types, online maps are classified as static and dynamic maps (Kraak, 2001). Both types have interactive interface and/or contents and designed to be viewed only. Static map is mainly presented in bitmap or jpeg format. It can be in interactive manner as it provides information using hyperlink provided on the interface of the map. On the other hand, dynamic map according to (Kraak, 2001), has animations on bitmap, jpeg or gif map format. AVI, MPEG or Quicktime provides the animation part of the map. These were the inventions of the early 2000s. Today, technological advances have enabled cartographic elements to be utilized on online maps. GoogleMap, introduced in 2005 is an excellent example of online map that possesses cartographic features which enable users to pan, zoom in and out, project current position, provide direction and conduct search. In this paper, online maps with web-based GIS features are referred to web-based GIS maps.

Web-Based Geographic Information System (Web-based GIS) Application

Web-based GIS is actually an extension of geographic information systems (GIS). GIS is a computer information system that has the capability of capturing, storing, manipulating and displaying geo-referenced data (Al-Sabhan, 2003; Worboys, 1995). Its usage is normally centralized and handled by knowledge personnel. Due to its complexity, platform dependency and expensiveness, the usage of GIS is not widely benefited by many organizations (Al-Sabhan, 2003). However, the internet and the World Wide Web have provided a platform for the public to use GIS application on their web browsers. Widely used in various disciplines such as urban management, tourism application, public participation, precision farming, urban management, e-government, crime control, epidemics management and monitoring and business, the potentials of web-based GIS should not be underestimated (Dragicevic, 2004).

Web-based GIS maps yield various benefits. Freely accessible, no installation required on the client device, easily updated and requires no boundaries are among others. Examples of web-based GIS application that are available include GoogleMap, Wikimapia and Yahoo! Local Maps. However, the effectiveness of the available application is still being evaluated. GoogleMap for example provides information based on users' input (Zainol et al., 2010). The more users' input on certain areas the more information other users will benefit. The use of web-based GIS applications in Malaysia initially started in early 2000 (Beh & Alias, 2003). Recently, these applications have gained popularity among Peninsular Malaysia Town and Country Planning Department and Malaysia Geoportal (JPBD, 2010; MacGDI, 2010). However, the current usage of web-based GIS is limited to data sharing among government agencies and data purchasing by the private sectors. Although these facilities are opened for public usage, most Malaysians prefer to use GoogleMap for their travelling purposes (Seong, 2009; Sia, 2009; Sivanandam, 2009; Zainol, et al., 2010).

Various studies have shown that incorporating GIS as a teaching tool has increased not only students' understanding but teachers' positive attitudes in the subject matter (Demirci, 2008, 2009; Demirci & Karaburun, 2009; Foster, 2008; Lateh Habibah & Raman, 2005). However, the implementation of GIS in schools is faced by various but similar challenges. Common challenges faced can be categorized by technical, institutional, staffing, funding and other factors impacting system development and implementation (Crosswell, 1991). Supplying schools with computers will not encourage the use of computers in teaching and learning. Teachers who teach Geography should be exposed to GIS during their training or preferably during their pursuing of degree programs. This is to enable them to integrate Geography curriculum and features in GIS application. In addition, initiatives by the Universiti Pendidikan Sultan Idris (UPSI) and Universiti Malaysia Sabah (UMS) in incorporating GIS application in their education degree programs should be commended (Che Ngah & Hashim, 2006; Dziauddin, 2004; Lateh & Muniandy, 2011).

Web-based GIS application is freely available on line. Therefore it provides a good initial start to introduce GIS in schools (Johansson & Pellikka, 2005). Furthermore, according to Johansson and

Pellikka (2005), time taken to comprehend the features is shorter as compare to understanding stand alone GIS. A web-based GIS application using Opensource OpenJUMP was once examined in a Malaysian school in Kedah in 2008 by Ratnam. Results show that the application is easily used and there is a positive achievement in post test done by the Form 1 students in the said school (Ratnam, 2008). However, it was found out that teachers face problems in integrating the application with the curriculum, where lacking of technical assistance and obtaining data was the main issue.

However, this is not the case today. GoogleMap for example, is able to display information on Malaysia easily, fast and with no additional software other than a web browser. In addition, information on streets, terrain, and location labeling is also available. Furthermore, users can also conduct search and obtain directions. This is not possible using normal paper-based map. In addition, web-based GIS application supersedes GIS application in terms of skills required in developing GIS model, data required and software purchases. Web-based GIS is able to save tax payers money in terms of training, data acquired and software costs. Challenges described above in implementing GIS in schools can be resolved. However, hardware, time and internet access factors still need to be taken into considerations.

Geographic Curriculum for Lower Secondary Schools in Malaysia

Initial observations reveal that GoogleMaps are not used and referred to at all in any lower secondary Geography lessons. Teachers do not take any initiative in incorporating this application even though it is highlighted in the Geography Lower Secondary Curriculum that the use of information technology and communication such as internet, web sites, emails, CD-ROM and teleconferences in teaching is encouraged (Kementerian Pendidikan Malaysia, 2000). Surprisingly, although GoogleMap is widely used by Malaysians for their travelling purposes, it is not widely known among teachers. This is based on initial observations.

Lower secondary level in Malaysian schools refers to Form 1 to Form 3 with school children aged 13 to 15 years old. At the end of Form 3, these children will be sitting for a major examination called Penilaian Menengah Rendah or also known as PMR. The results of PMR will determine the placement of the children in their next level of education, higher secondary whether to be in science stream or arts stream. At PMR level they are required to sit for 7 subjects for the non Muslim and 8 subjects for the Muslim. The required subjects are Bahasa Malaysia, English, Mathematics, Science, Living Skills, History and Geography with Islamic Studies for the Muslims. Therefore, as one of the major subjects in PMR, Geography subject should be mastered by students. The use of technology will enable students to grasp the subject creatively and innovatively and this has been proven by many studies (Demirci, 2008; Foster, 2008).

METHODS AND PROCEDURES

The objectives of this study are to identify the features and components of the current web-based GIS application and to suggest ways on how it can be utilized to aid the teaching of Geography in lower secondary school. Therefore Malaysian Geography subject curriculums for Form 1 to Form 3 are used as main documents for content analysis. The output of the analysis is matched against the features offered by web-based GIS. By integrating both the curriculums and web-based GIS features, the output will show the matches.

Geography Subject Curriculums for Form 1 to Form 3

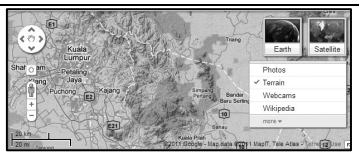
The content of Geography subject curriculum can be divided into three categories: Geography Skills, Physical and Human Geography and Local Geography Studies. These categories run across all the school's levels, Form 1 to Form 3. The objectives of first category, Geography Skills, are to allow students to investigate and relate location aspect, direction, scales and distance within spatial organization. Students are also expected to grasp skills in drafting tables, drawing graphs, charts, maps, figures and to produce inferences. In the second category, students are expected to focus on the correlation between the physical entities and the human behavior. This has to be carried out based on eight themes: landform and its potentials; weather, climate and its effects; natural vegetation and wild lives; population dynamics; settlement and its growth; transportation and communication; resources and finally economic activities. The third category focuses on the application of the knowledge obtained from both the first and second categories described earlier.

In addition to the above categories, the curriculums also outlined the thinking and generic skills. The former focuses on critical thinking skills and creative thinking. Likewise the later incorporates communication skills, technological application skills, project planning and implementation, team work, problem solving skills, management and analysis of the chosen information and culture comprehension.

Web-based GIS Features

GoogleMap, a web-based GIS application, is used as the tool since it is widely known among Malaysians (Sia, 2009; Sivanandam, 2009; Zainol et al., 2009). In addition, GoogleMap offers map, earth, satellite, photos and terrain views in its application. All these features are used in this study. Table 1 shows the map features and the snapshots of the application available in GoogleMap.

Table 1 Snapshots of GoogleMap Application

No.	View	Features	Snapshots
1	Map	Pan Zoom	
2	Earth	Pan Zoom 3D viewing control	
3	Satellite	Pan Zoom	
4	Terrain	Pan Zoom	
5	Photos	Display selected photo only	

RESULTS AND DISCUSSION

The results show that GoogleMap application can be used in enhancing students' thinking and generic skills. Table 2 shows the matching between Geography subject curriculum and features available in GoogleMap application.

Table 2: Matching between Geography Subject Curriculum and GoogleMap Application

Curriculum Category	Geography Subject Curriculum	GoogleMap Features	Thinking and Generic Skills
Geography Skills	Students are to investigate and relate location aspect, direction, scales and distance within spatial organization	Map viewing and browsing Distance measuring Earth Satellite Map printing	Critical thinking Creative thinking Communication skills Technological application skills
Physical and Human Geography	Students are to relate landform and its potentials; weather, climate and its effects; natural vegetation and wild lives; population dynamics; settlement and its growth; transportation and communication; resources and economic	Map viewing and browsing Earth Satellite Terrain Photos Webcams	Critical thinking Creative thinking Communication skills Technological application skills Management and analysis of the chosen information

	activities	Map printing	Culture comprehension
Local Geography Studies	Students are to apply both the above categories in their project paper to be submitted at the end of the school year	Search Ask for direction Map printing Earth printing Satellite printing Photos	Communication skills Technological application skills Project planning and implementation Team work Problem solving skills Management and analysis of the chosen information Culture comprehension

Teachers can utilize GoogleMap features and application in their classroom provided they have the hardware components which consists of computer processing unit (CPU) or a laptop, internet access, display screen and a projector. With the Malaysian government policy on one house on personal computer, this will assist teacher in getting students to follow up what they have studied in classroom at home using their own personal computers (PCs). Moreover, Malaysia government has given tax deduction for those who purchase computers up to RM3000 per person for a three year period (LHDN, 2011). Furthermore, with tax deduction in subscribing broadband at home will encourage more Malaysians to obtain internet access at home (LHDN, 2011).

With the availability of data and information, user friendly interface, search capability, multiple map viewing functions and freely available online, GoogleMap is able to provide a good foundation for teachers to use web-based GIS application in schools as a teaching tool. The integration between the curriculum and GoogleMap features has been pointed out. In addition, there won't be any problems in getting sufficient information and technical jargons have been avoided. Therefore, teachers need to be creative and innovative to take the challenge in using the current web-based GIS application such as GoogleMap as a teaching tool. Moreover, in order for such application to be implemented in schools, web-based GIS application needs to be incorporated in Geography subject curriculum similar to the steps taken in the Turkey and Singapore (Demirci, 2009; Yap et al., 2008). The use of web-based GIS application and GIS application should not be limited to teaching and learning of Geography but also Science and History subjects. This will empower the teaching and learning of these subjects in secondary schools in Malaysia.

CONCLUSION

Computer literacy issue among Malaysians should not be used as an excuse not to use computer and internet in teaching and learning of Geography subject in Malaysia. Almost 65% of the population is internet subscribers. Therefore, the use of web-based GIS application in schools should be implemented and benefited.

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ENGAGING CHILDREN TO STORY TELL IN A TEXT DESIGN CONTEXT

By using engagement features in NEMD Model (Norma™ Engagement Multimedia Design Model)

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ABSTRACT

It has been a fact that our teenagers and children are now growing in an era of new technology convergences. Every innovative technique is design to enable children to be engaged and addicted to the environment designed for them. When some form of these addictive features in computer games were used to develop story telling materials in a text design to teach children to tell stories the children were found to be very engaged and able to relate to the stories told by their teachers. "NEMD Model - Norma™ Engagement Multimedia Design Model" (2007) was a rename of an extended research done on a previous "An Engaging Multimedia Design Model" (2004) developed through observations and experimental studies of young teens in engaging situations as they interact with computers. By including the engaging features of the NEMD Model in this text design of an "interactive illustration" of a preschool book series *"Siri 3 Sahabat dan SiRama-Rama"*, correctly used by a group of nurseries in Malaysia, the children were able to remember what we wanted them to remember when they reached a level of being engaged. The children, from three different ethnics, Malay, Chinese and Indians could remember the names of the characters, stories, scripts and recite a new phrase 'pantun' (a traditional rhyme phrases) created to suit the stories in the books) written in a Malay Language in these books at a very fast speed. This paper will discuss on how the transformation of engagement features helped children to acquire story telling skills.

Keywords
Multimedia, engagement, storytelling, digital storytelling, model

INTRODUCTION

Materials design for children, either books or multimedia, need to follow the psychological needs and wish lists of children to make them successful. When the psychological needs and wish list is fulfilled we will be able to instill a long lasting and sustainable interest for them to use and reused the product designed for them.

BACKGROUND

"NEMD Model - Norma™ Engagement Multimedia Design Model" (2007) was a rename of an extended research done on a previous "An Engaging Multimedia Design Model" (2004) developed through observations and experimental studies of young teens in engaging situations as they interact with computers. By including the engaging features of the NEMD's Model in a text design of an "interactive illustration" of a preschool book series *"Siri 3 Sahabat dan SiRama-Rama"*, the children were able to remember what we wanted them to remember when they reached a level of being engaged

In this model, features and factors contributing to why teenagers become addicted to computer games were identified. Features in this model have been tested in various learning platforms so much so that a patented Engaging Learning Model and system has been developed from this. A study relating the application of engagement factors in the NEMD's Model to a

Student-Centred Learning (SCL) teaching methodology has given positive impact to the teaching and learning process experienced by selected university students taking a language in multimedia course. They were not only engaged and highly motivated to the task given to them but were also able to produce optimum learning outcomes.

By including the engaging features in the NEMD Model in a text design of an "interactive illustration" of a preschool book series *"Siri 3 Sahabat dan SiRama-Rama"*, correctly used by a group of nurseries in Malaysia, the children were able to remember what we wanted them to remember when a high level of engagement is reached. The children could remember the names of the characters, stories, scripts and the 'pantun' rhymes in these books as soon as they were being told despite the fact that most of the children have different mother tongue language and dialects.

ENGAGEMENT

The success of acquiring the story telling skills has a lot to do with the fact that the children were engaged during the cause of action. Before a further discussion on engaging children to story-tell it is best a definition of engagement is established in this context.

From a patented engagement system, engagement in the NEMD's Model was defined as an important psychological phenomenon that could determine the success or failure of a technological design system. Any form of representation of systems' design that could make the user or audience 'remain seated', 'be fully engrossed', which is referred to as 'fully engaged' and has "the ability to sustain the engagement level, at a reasonable period of time of one to two hours or more" is a vital factor to "ensure user engagement" and will be defined as "successful" by the end- user or audience.

Even though the engagement system was developed for end- users or audiences amongst teenagers aged 12 to 14, aged 15 to 16 to some extend aged 17 and beyond, application of engagement features in text design has attracted even young children as young as 3 years old.

NEMD MODEL (Norma™ Engagement Multimedia Design Model)

The engagement factors in The NEMD Model are of those mentioned in the "An Engaging Multimedia Design Model" (Said, 2004). Further development of the model has revealed the possibility of measuring this psychological phenomenon. "The Engagement Measuring System"©2004, 2007 in NEMD Model (Norma™ Engagement Multimedia Design Model) could enable us to determine:

- The level of engagement a particular design feature could give its users
- What design feature could give disengagement
- What design feature could give short term engagement
- What design feature could give slightly longer engagement term
- What design feature could give long engagement term
- And what design feature could give sustained engagement term

In this research context, a design system (deduced from the results obtained through experiments conducted to develop the model) is only termed as "a successful design system" if the design could engage and sustained engagement to the user or audience of the system. The system, thereby, could be: a multimedia design system or application; an experiential learning system or environment; an educational learning system or training system; or a multimedia presentation, to some extend a corporate video or advertising presentation. Therefore, in a context when systems are gauge based on successfulness, the system is a failure when it fails to engage the user.

Therefore, at the end of the day the outcomes of these failures are

- Many educational games developed by government bodies like the ministry of education; sponsored projects done by companies on websites and CDs; and educational courseware developed by courseware developers could not sell well or attract audiences as those in some games because none of these designs follow any form of design matrix to indicate at what level of engagement could a user be at when interacting with the multimedia that the designers have designed.

- The educational games does not become engaging after a short while because the flaws are being repeated in other designs too because their designs are mainly a copy or modification of what others have done without following any form of design matrix to ensure the level of engagement is sustained.

- When educational websites have designs that could not engage and sustained engagement the websites will be rarely visited by their target audiences

- Educational courseware that have designs that could not engage and sustained engagement will defeat the educational purpose they intended to perform

- Educational experiential centers like museums, and theme parks, etc. gets fewer visitors to dwell on its simulation or virtual reality design because the center lacks designs that could engage and sustained user engagement

DESIGNING FOR CHILDREN

Research has proven that lots of companies have designed multimedia applications for children. Some worked and some do not (Hughes, 2000). Despite good design features children find some educational CDs designed for them boring or overloading (Said, 2004)

We know that any form of material designed for children need to abide by their needs and desires for them to be successful in the children's eyes. Prolonged and sustainable interest could only be achieved if these wish list and desires are met. Most designers do take children into consideration when designing products for children used especially multimedia CDs designed for them. Designers often include them either at the beginning, during the design process or at the end as testers of informants (Libby, 1998). When the iterative production process is complete the role of children stops as end users.

Observation through the experiments conducted to develop the model has revealed that a product design for children must not end there as a product. Designers must include a portion in their design a place where children could feel that they belong and are part of the creation even if the process is over and the product is developed. It is this part of the creation that makes children be engaged and sustained engagement.

INTERACTIVITY

One design feature that could make users feel that they are still part of the creation of the product is interactivity. Interactivity is a very important feature when designing any form of media, name it texts, hypertext and hypermedia. The opportunity and chances to interact given by the media designed for users has proven to give users the "felt presents" of being part of the creation.

Audiences stay tuned to talk shows when they are given the chance to interact with the host via phone calls, SMS and video conferencing. Interactivity has proven successful to engage users, especially children, to continue using, remained attracted and engrossed to the systems designed for them. The opportunities given in interactive features designed in computer games and play stations has proven to sustain engagement to the level of addictive.

When the chance to interact is transformed in books, the design feature must include making something on paper interactive. "Interactive illustration™" is the term used to describe interactive feature in the book designed to story tell. It is this form of interactivity that has made children enticed to stories told to them and to story-tell after that.

"SIRI 3 SAHABAT DAN SIRAMA-RAMA" (3 FRIENDS AND THE LITTLE BUTTERFLY)

The book series of *"Siri 3 Sahabat dan SiRama-Rama"* (3 Friends and the Little Butterfly) was launched on 1st October 2005 during a graduation ceremony of group of nurseries under the government national unity program in Malaysia. The package is made up of six big books (five stories and one board–game like book feature with pop-ups). The package includes figurines and place stands.

INTERACTIVE ILLUSTRATION

Interactive Illustration is a design feature used in this package that has managed to entice children to story-tell. The stories in the five books accompanying the package were made alive partly because of this interactive feature.

Fig.1: The Interactive Illustration of the board-game like pop –ups from one of the six big books in the story package given to the children

ENGAGEMENT FEATURE VERSUS DRAMA

There are six engagement factors in the engagement model. Users become engaged at various levels when these features are present in multimedia design systems. The six engagement factors (GIFCES) are:

- **G**oals
- **I**mmediacy
- **F**eedback
- **C**onstruct
- **E**xperience
- **S**imulation

When the six engagement factors are place besides factors in drama presentation, the researcher found that children could be as engaged in multimedia as when doing performing arts because many of the factors contributing to engagement in multimedia could be traced when children are taught to dramatized what they have read or being read to. It is from this observation that the stories in the package were presented in dialogue drama script form.

THE STORIES

The stories in the package cover on universal moral values. The characters are from three ethnic groups, Malay, Chinese and Indians of both genders doing everyday mundane things together. The butterfly is the savior of any wrong doings the children made whilst out playing.

THE METHOD

There are two form of exercise involved in this study. Group 1 and Group 2 were relayed the same stories written in a dialogue drama script.

Exercise 1:

In this exercise, the Group 1 children were told of the stories in the book by their teachers. The children were given phrases to memorize in chorus, besides drama scripts and probes based on the stories. The children were given three weeks to act out the story into a play and performed in front of a group of audience.

Fig. 2: Dramatizing the stories being told using related probes and drama dialogue scripts.

Exercise 2:

Exercise 2 involves the use of the story telling package Group 2 was given the story package. They were relayed stories in the big books following the dialogue scripts found in the books. The children were later shown the board–game like book feature with pop-ups and figurines of characters in the books. The children were later allowed to tell the stories as told.

FINDINGS FROM THE STUDY

Observations from both exercise has given insights into how levels of engagement could influence children's acquisition of storytelling skills. The children in the study were able to relay the stories just as it is being told.

In Exercise 1, the Group 1 children were able to express exact dialogues after they have mastered the whole story. Practically the whole group member was able to recite the *pantuns* and dialogues found in the books after three weeks. No problems were encountered when there were absentees because practically everybody knows the dialogue and were able to connect to the stories in the books. They became engaged once they are able to memorize and therefore able to recite the *pantuns* perfectly despite the fact that the rhyme phrases are not of their mother tongue.

In Exercise 2, the Group 2 children were given the story package. The children got engaged through the design feature in the package. The interactive illustration makes the stories come alive. After hearing the stories being told by their teachers, the children rush to the board-game like pop-ups and start making up their own dialogue as the element of role play sets in. During a later course the children starts to mix all the stories and created their own. They became very engaged and were able to remember the names of the characters, stories, scripts and recite the *pantuns* in two days.

CONCLUSION

From the findings above it could be concluded that children are able to remember what we wanted them to remember when they reached a level of being engaged. The findings have justified the point made in The NEMD Model that engagement level is reached when a user acquired skills moved from motor skills to mental model skills. Acquisition of drama dialogues in Exercise 1 and interactive illustration feature in Exercise 2 has successfully moved children's acquisitions from motor skills to mental model skills. Thus both sets of exercise have proven to sustain children's engagement and therefore able to make them remember what we wanted them to remember.

ACKNOWLEDGMENTS

This study owns its gratitude to Universiti Putra Malaysia (UPM) for granting numerous research grants to do an extended research on "A Engaging Multimedia Design Model" (2004) till it gets to its present form The NEMD Model (Norma™ Engagement Multimedia Design Model). This research also likes to convey it's appreciation to the children involved in this research and all those directly and indirectly involved in this research.

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ENGLISH MAJOR STUDENTS' OPINIONS OF THEIR DEPARTMENTS' WEBSITES

İNGİLİZ DİLİ ÖĞRENCİLERİNİN BÖLÜMLERİNİN WEB SİTELERİ HAKKINDAKİ GÖRÜŞLERİ

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ABSTRACT

University websites serve as sharing information with students whether prospective or enrolled. Often, before entering their departments, students visit them to have an idea as to what it would be like to be a part of that university and department. In that sense, websites help students in deciding whether the university matches their expectations. After enrollment, websites start to serve as their representative and an interactive ground for students, academics and administrative personnel of the university. Since schools exist for students, their opinions matter. This study aimed to have students' opinions of their university websites. For the purposes of this study, students of English or related majors (such as English language teaching, English linguistics, English language and literature, translation studies, American culture and literature) were sent a questionnaire to find out their opinions of their departments' websites. It is hoped that the feedback has implications, however indirectly, for universities and departments to promote themselves in a more realistic manner that suits their students' needs.

Keywords: Website, academic resume, higher education, educational marketing, department

Introduction

In Turkey, there are 104 state universities and 62 foundation-owned higher education institutions with 7 private vocational schools (http://www.yok.gov.tr) although many homepages and websites of Turkish universities or their departments have not been very active or worse, there are many problems with them such as dysfunctional links or existence of missing information. Despite there exists improvement, some problems still remain such as design and layout problems; for instance, those related to information overload, inadequacy of negative space (space around and between the subject(s) of an image), inappropriate color scheme, or typography, you can see pages relating to announcements or resumes which have not been updated. Especially important are the resumes of academics, recruited by the school, the very existence of which is the student who demands accountability as to the qualifications of the teaching staff including the question as to which course is offered by which academicians with what qualifications based on what criteria.

Theoretical Framework

As part of new technologies, the Internet and websites are one of the fastest and most effective ways of communication. Compared to traditional ways of communication, Internet-based communication may provide information in either synchronous or asynchronous way. In synchronous communication, the response is received at the same time as the message is sent, that means interaction occurs at the same time like in chat (Ohlund, et.al., 2000: 406). In asynchronous communication, location and time of each interaction change. Hence, a caller system is needed to receive the message back at a later time. Websites as part of Internet-based communication keep several advantages of new technologies: Web transmits messages (or information) either to one receiver or more people. Since it is asynchronous, it does not allow real interaction. Its most significant advantage however is its speed, its use in the global environment and its low cost (Bonchek, 1997: 10, cited in Timisi 2003: 126). The multi-channel

environment may facilitate the negotiations between the organization and the public (Kent and Taylor, 1998: 322).

Websites are suitable for two-way communication. As Kent and Taylor (1998) state the web is ¨an excellent information dissemination tool and useful for getting a message out¨ (325). As an organization, what you would like to announce, what you will let your stakeholders learn about yourself and how much information you will reveal on the website is manipulated by you. On the other hand, your stakeholders expect to acquire as much information as they could through this web source. In our case, students as stakeholders will ask for genuine information about the quality of education, courses, programs as well as on-campus accommodation, social life and other challenging opportunities offered by the university. While they are seeking answers for their questions on the Internet, the university tries to capture the interest of highly remarkable young talents who have taken high marks from the University Entrance Exam and still in quest of the right university to be enrolled / to write down in the preference sheet.

University websites with their rich and updated content besides their layouts, colors and user-friendly interface form a positive image in students' minds while providing detailed information about their educational activities and academic assets. The key point where the university website disseminates information given by the service provider (the university) to the stakeholders (the students) is the quality of that information. Dragulanescu (2002: 250) states that the information is high quality ¨if the provider has taken into consideration both the stated and implied needs of the customers/users (before designing, manufacturing, and supplying the product) as well as their reactions (after having supplied the product)¨. Kent and Taylor (1998) specify five key strategies to build dialogic communication on the web. These can be reinterpreted as factors to create a successful website:

1. The organization needs to have a feedback loop so that it can provide the information that publics need or desire.
2. Websites should make an effort to include general information valuable for all kinds of publics. Publishing historical information is not new but ¨content is what should drive an effective website, and not the fancy graphics that many web sites currently rely upon¨.
3. Websites should contain features that make them attractive for repeating visits. Updated information, changing issues and special forums, are some examples.
4. The contents should be well-organized and hierarchical. Like the second factor, authors insist on that the content should be textual rather than graphical although today many experts agree that graphics and textual design must have a balance.
5. About the links to other sites, Kent and Taylor warn the web designers that offering outer links is usually preferred because of ¨goodwill¨ but it might be a handicap for you as the visitors may never get back to your website. They recommend that web sites should include ¨only essential links with clearly marked paths for visitors to return to your site¨ (Kent and Taylor, 1998: 330).

Eschenfelder, Beachboard, McClure and Wyman (1999) published the criteria used to assess the design and management of U.S. federal government websites. Smith (2001) adapted these criteria of website design from Eschenfelder et.al. (1999) in order to evaluate five government websites in New Zealand. In both studies, the criteria were grouped under two headings as information content and ease-of-use. The former, which has 7 or 8 subtitles, refers to the nature of the information, mentioning of the services provided by that website, the accuracy of the web information, privacy of the user and the use of updated sources and data on the website. The latter, having 5 subtitles in both, is related to links, feedback, accessibility, design, and navigability of the website content. Table 1 compares and contrasts the criteria used in both studies.

Criteria used by Smith (2001)	**Criteria used by Eschenfelder, Beachboard, McClure and Wyman (1999)**
1 Information Content	**1. Information Content**
1.1. Orientation to website (7 criteria): It includes the mission and scope of the website, liability statement, services provided by the website, instructions to use the website and the news alerts.	1.1. Orientation to website (7 criteria):
1.2. Content (10 criteria) It includes matching the mission and the needs of the audience, balanced amount of information, having direct and necessary information. It includes criteria about the language use such as clear and consistent language style, unbiased statements and positive professional tone.	1.2. Content (12 criteria)
1.3. Currency (3 criteria): This is about the updated content with the identified updating periods.	1.3. Currency (3 criteria):
1.4. Metadata: Facilitates retrieval, navigation (4 criteria): It includes clear headings, appropriate metatags and consistent use of terminology and layouts with the	1.4. Bibliographic Control (5 criteria) It includes clear headings, and consistent

headings.	use of terminology and layouts with these headings.
1.5. Services (3 criteria): Availability of services which are operational and relevant to the user's needs	1.5. Services (4 criteria):
1.6. Accuracy (4 criteria): It refers to real information as well as having the sources cited and the accurate use of grammar, spelling and no mistakes of typing.	1.6. Accuracy (criteria):
1.7. Privacy (3 criteria): Users' privacy rights and encrypted exchange of information with the user are comprised under this heading.	1.7. Privacy (3 criteria):
1.8. External recognition (3 criteria): Ways in which the value of the site is recognized by users such as awards and reviews besides the number of links.	
2. Ease-of-Use Criteria	**2. Ease-of-Use Criteria**
2.1. Links (6 criteria): Updated links, shortcuts, warnings about the links or links to other relevant pages are mentioned in this subsection.	2.1. Quality of links (9 criteria): Speed of links and minimal use of bright colors and large graphics are also included in this subsection.
2.2. Feedback Mechanisms (5 criteria): Contact details for entity, data forms and instructions for the user are included.	2.2. Feedback Mechanisms (2 criteria):
2.3. Accessibility (6 criteria): Speed of response, easy and rapid access to the website, publishing on the search tools, backlink to the entity and using not a complex URL which is not open to confusion	2.3. Accessibility (4 criteria):
2.4. Design (7 criteria): Functional format and graphic design, consistent format through website, use of Standard HTML, use of higher level technology such as frames and Java Script, use of downloadable small-size images and documents	2.4. Design (11 criteria): More detailed criteria of graphics use are included here. Another criterion about attention-getting devices like use of bold, italics and blinking is seen in this subsection.
2.5. Navigability (7 criteria): This subsection includes logical organization of the website, use of conventional navigation models with options and facilitated type of browsing as well as providing search engine.	2.5. Navigability (7 criteria):

Table 1. Comparison of the website design and evaluation criteria specified by smith (2001) and eschenfelder, et.al. (1999).

In two other studies, a positive website design has been assessed through different aspects. Kim, et.al. (1999) surveyed on health related websites and peer-reviewed journals to find out common criteria which were being benefited for designing websites on health issues. They included 13 criteria which were rated by the participants. Dragulanescu (2002) however implemented Total Quality Management tools to make questions for the users to answer about the perfect-like web design which meets the basic needs or desires of web users. Thus, this differs from the others with its focus on the viewpoint of users rather than considering designers' or service providers' perceptions. Table 2 compares the criteria revealed by these two above mentioned research studies.

Criteria proposed by Kim et. al. (1999)	**Criteria proposed by Dragulanescu (2002)**
Content: quality, reliability, accuracy, depth) **Design and aesthetics**: layout, interactivity, graphics, use of media **Disclosure of authors, sponsors, developers** **Currency of information**: frequency of updates **Authority of source**: reputation of source, trustworthiness **Ease of use**: usability, navigability) **Accessibility and availability** **Links** **Correct documentation**: presentation of clear references **Intended audience** **Contact addresses/ feedback mechanism** **User support** **Miscellaneous**	**Accuracy**: the extent / degree of information, its exactness and correctness **Authority**: the extent / degree to which the author could be considered an expert in his / her field). **Coverage**: the extent / degree to which topics were observed, analyzed and reported **Currentness**: the extent / degree to which the distributed information belongs to the time in progress **Density**: the extent / degree to which comprehensive and relevant information is displayed on the webpage **Interactivity**: the extent / degree to which two-way communication is operating between the user and author

Table 2. Comparison of the website design criteria of health-related web design and user-focused criteria (adapted from Kim, et.al., 1999: 648 and Dragulanescu, 2002: 253).

Studies about guidelines for making successful university or college websites are a few. Borges, Morales and Rodriguez (1999; cited in Zhang and von Dran, 2000: 1254) adapted Nielsen's guidelines to evaluate 10 university websites and performed user tests on them. Zhang and Von Dran (2000) implemented Herzberg's theory to assess web design to test evaluation on a two-factor model. They formed questions related to features about 12 criteria which were grouped under two factors. The questions were replied by a selected group of university students. The two factors they called were hygiene and motivator factors.

Pinto et.al. (2009) assessed the information provided by Spanish universities on their websites regarding accreditation procedures. They used metric analysis and SWOT analysis as the methodology. The essential structure was based on seven main criteria on 70 indicators not equally distributed among all. The visibility of information, correctness and completeness had the greatest number of indicators while authority, updatedness, accessibility, quality assessment and navigability were the other five criteria to be assessed.

Criteria to evaluate the websites	**Number of survey questions / Sub-criteria**
User perceptions	Q1-Q2-User interest Q3-Manipulative manner Q4-Trustworthiness of the website Q6-User satisfaction
Accuracy	Q5-Accuracy of information
Consistency	Q7-Consistency of quality Q20-Consistency of layout Q25-Consistency of translation
Design	Q8-Plainness Q9-Metadata (hierarchical order of menus) Q10-Q11-Q12-Visual-textual balance Q13-Vividness Q14-Corporate images and colors Q15-Graphics design Q16-Audio-visual format
Content	Q17-Q27-Being informative Q18-Transparency Q22-Categorizing information Q17-Q23-Q26-Use of PR elements
Currency	Q19-Updatedness
Ease-of-use	Q21-Q30-Accessibility of services
Feedback mechanisms / Interactivity	Q24-Student feedback Q28-Contact information Q29-Server-side scripting

Table 3. Criteria of the survey on website design evaluation

As the above mentioned review of the literature show, all aspects of websites are currently studied by researchers so as to enhance their potentials in informing users and visitors. This need is also pressing in Turkey where the Internet is currently used for attaining information about locates and contexts that are difficult to reach physically. Hence, this study aimed to collect the opinions of English or related majors (English language teaching, English linguistics, English language and literature, translation studies (English), American language and literature) about their university's or department's websites.

Methods

For the survey about the evaluation of website design, 30 questions have been formed depending on various aspects of 8 criteria. These 8 main criteria have 24 sub-criteria with varying rates in total. Table 3 displays these criteria with the sub-criteria for each one and the number of every individual question assessing that sub-criterion.

The criteria of accuracy, design, content, currency, ease-of-use and feedback mechanisms / interactivity exist somehow in earlier studies in the literature. However, rather than measuring the users' viewpoints, most of the former studies have been based on the criteria significant for web designers or the executives of organizations as being the publishers of their websites. Furthermore, only a few studies have focused on how to improve university websites. Therefore, assessing what university students think about the website of a higher education institution is one of the primary objectives of this study. User perceptions with the four related sub-criteria endeavor to assess to what extent user interest, the

manipulative manner of the organization, trustworthiness of the website as a source of information and the user satisfaction take a part in the success of a website.

The design criterion has 7 sub-criteria including plainness, metadata, visual-textual balance, vividness, the use of corporate images and colors, graphics design and audio-visual format. The metadata called as 'bibliographic control' in Eschenfelder et.al. (1999), is one of the sub-criteria related to web design in our study. Accuracy like in Smith (2001) denotes the accuracy and reality of released information. Currency, as one of the basic criteria of all studies, mentions how much updated information is used on the web. Ease-of-use, like in Kim et.al. (1999), has been included as a main criterion. In the survey of website design evaluation, it is accepted as the accessibility of organizational services on the Internet while having a broader sense in the resume evaluation survey with the sub-criteria of accessibility and navigability.

Consistency is one of the main criteria in website design evaluation. It refers to consistency of the quality both on the homepage and on the related departmental websites. It also refers to the consistency of layout and the consistency of translation of Turkish website into foreign languages.

The content here has a narrower meaning since it indicates the characteristics of the information released. It has four sub-criteria of being informative (not manipulative), transparent, categorizational and including elements of Public Relations with the focus of publicity in general.

Parallel to the current tendencies, interactivity is accepted as one of the basic criteria for the study. Interactivity is named as "feedback mechanisms" by Smitth (2001) and Eschenfelder, et.al. (1999). That is because three questions have direct emphases on acquiring student feedback, publishing contact information to have general feedback and using server-side scripting to make feedback process easier.

Criteria for academic resumes	Number of survey questions/ Sub-criteria
Content	Academic services and products Q1-Publications Q2-Q10-Q11-Courses offered Q3-Research interests Q4-Oral presentations Q10-Q11-Theses supervised
	Academic competence and skills Q5-Q6-Linguistic(L2) competence Q7-Academic competence
	Personal information Q12-Q13-Q14-Age, marital status, hobbies Q8-Q9-Memberships
Design	Q15-Visual format Q20-Textual format Q21-Downloadable file formats
Ease-of-use	Q16-Accessibility of services Q17-Q18-Q19-Navigability

Table 4. Criteria of the survey on academic resume evaluation

The second survey, which aims to evaluate the quality of academic resumes, has fewer criteria. There are three main criteria as content, design and ease-of-use. Table 5 reveals the sub-criteria and questions evaluating each one.

The content here is again related to the information content in resumes while focusing on three different kinds of data. Academic services and products with 5 sub-criteria, academic competence and skills with 3 sub-criteria and personal information with 3 sub-criteria comprise various aspects of the content.

Similar to the survey of website design evaluation, design criterion is based on textual and visual formats used in the resumes. A third sub-criterion is added to this survey to check the importance of using downloadable file formats. As mentioned before, ease-of-use indicates the accessibility and navigability of the web sources while questioning the relevance of having links to external websites.

Participants

One hundred twenty-five state university students in total from cities of Tekirdağ, Ankara, İstanbul, İzmir, Antalya and Diyarbakır participated in our study. Since most of the web content indexed is English, it is expected of the universities to provide an English version of its web site as well. This fact is one of the reasons for us to send questionnaires to those with a command of English. Secondly, learning a foreign language is an imaginatively and cognitively enriching experience, and helps learners

see matters or events from multiple perspectives. Besides, their youth suggests their familiarity with technology. Since most of them are females, it is thought they have been sensitive to the dimension of design.

The Instrument

A questionnaire included two parts containing 30 items related to university web site in general and 24 to resumes in particular. The survey asked the participants to rate each of the items following on a 1-5 Likert Scale (Strongly agree, Agree, Neutral, Disagree, Strongly disagree). SPSS was used to find out mean scores (along with standard errors and standard deviations) of the items. They ranged from relationship between the effect of a web site and the choice of a university to details regarding the information content, layout, and design of the website in general.

The preparation process of the questionnaire started over a year ago, and it has finalized just before its distribution of the questionnaire. used in our study (actually a pilot questionnaire was administered but due to the problems related to its timing, the results were not evaluated). Professional experts' ideas were important, therefore the Web Marketing Association was emailed. William Rice, the president, informed that they evaluated all of their websites on the items of design, innovation, content, technology, interactivity, copywriting, and ease of use on a scale of ten (W. Rice, May 4, 2009). The association has been evaluating the universities submitted for web awards (the reader can see their report on the 1,092 sites submitted to the WebAwards in 2010 in our 24 page Attributes of an Award Winning Website Study).

In our process, the feedback about the quality and comprehensiveness of the items were obtained from unstructured interviews with the staff of IT departments, press offices, computer teaching departments, an employee of the Ministry of Culture, and academics actively involved in web design and students' ideas. Web sites of various universities in Turkey was analyzed as well. The questionnaire was made accessible online, and the link was sent online to the participants by mail and by using social network sites' interest groups.

The Cronbach's alpha coefficient of the scale was found to be .927 indicating a relatively high internal consistency of the items in the scale. In the narration and explanation of the data as follows, a cut-off point was determined for convenience and ease of reading. The means equal to or above 4.3 (in the tables, those typed in bold) indicated a threshold for good agreement for item whereas those equal to or below 3 (in the tables, those given in italics) was considered to have a lower importance given by the students for the item in question.

Findings

Though lower than the mean score of 4.3, the first item deserves special attention since majority of the students claim to be checking the web sites of their future universities before deciding for application. When they gave their opinion on whether the web site of a department had an effect on their decision, they tended to disagree on the effect of the web site in choosing their department (2.72). However, these results suggest that they give importance to the functions or potential influence of a university web site in forming students' opinions who seek for information about their future schools.

	Items	Mean	St Err.	St Dev.
1	I investigate the home page (opening page) of the university before choosing it for application.	3,9120	,11303	1,26374
2	Prior to application to a university, I investigate the web site of the department.	3,7760	,11122	1,24346
3	The home page (opening page) of the university is/was effective on the question to whether or not to apply for the university.	3,0080	,10746	1,20145
4	The web site of a department is /was effective on whether or not to choose it for application.	*2,7200*	,10632	1,18866
5	The web sites of the educational institutions give ideas about the quality of the education given there.	3,6400	,09732	1,08806
6	I am/was content with the web site of my university.	3,4720	,10929	1,22195
7	There should be no difference as to the quality of the home page (opening page) and the sites of departments.	**4,3920**	,07440	,83179
8	The home page (opening page) of web site should be plain.	3,5200	,09477	1,05952
9	Web site should have clear and hierarchically structured submenus.	**4,5600**	,05611	,62733
10	There should be a balance between visual and textual elements.	**4,3120**	,06855	,76639
11	Web site should have visual elements rather than textual ones.	3,0080	,08980	1,00399
12	Web site should have textual elements rather than visual ones.	*2,8960*	,09216	1,03038

13	Web site should have a variety of colors.	3,5520	,08905	,99560
14	Web site should use the logo and theme colors of the university.	3,9360	,08092	,90468
15	Web site should have animations.	3,3040	,09852	1,10149
16	Web site should have music and sound effects.	3,0800	,11393	1,27381
17	Web site should have an introductory video.	**4,5200**	,06584	,73616
18	Web site should provide the institutional information in a transparent manner.	**4,4880**	,06077	,67937
19	Attention should be paid attention to the update the web site.	**4,7280**	,05492	,61403
20	The sites connected to the home page should be in the same format as the opening page.	4,2880	,08410	,94028
21	Web site should contain announcements and news archive, and this archive should be easily accessible.	**4,7120**	,04927	,55089
22	There should be separate sections for announcements each with relevant content for the student, the academician or the general viewer.	**4,3760**	,07842	,87680
23	A press and media section should be constituted for the news related to the university in the press and media.	4,2400	,06947	,77668
24	The web site should have a student portal.	**4,4720**	,06679	,74678
25	The Turkish content in the home page and the department sites should take place in the English web page as well.	**4,4800**	,06486	,72513
26	Web site should have elements aimed for promoting the university rather than providing information about it.	*2,6160*	,08015	,89608
27	Web site should have elements aimed for providing information about the university rather than promoting it.	3,8160	,07482	,83651
28	The home page and sites connected should have the email addresses of the units concerned.	**4,5440**	,05623	,62867
29	To send a message to the unit(s) concerned, the web site should have a message box on the screen.	**4,4480**	,05843	,65323
30	If the university has its own radio station, it should broadcast from the site.	4,2400	,07903	,88354

Table 5. Students' opinions of university's and departments' websites

As can be seen in Table 5, according to the results, following points deserve special attention since these results constitute what students demand in that

- web sites are updated regularly (4.72)
- an announcements section and an easily accessible section for news archive is available (4.71)
- submenus are clear and hierarchically structured (4.56)
- email addresses are shared (4.54)
- an introductory video of the university/ department is uploaded (4.52)
- information about the university is transparent (4.48)
- content is available in English (4.48)
- a message box is available to visitors to send messages to specific units (4.44)
- a student portal is available (4.47)
- the home page (opening page) of the department and that of the university's are similar in quality (4.39)
- specific announcements sections are available for target viewers: one for the academics, one for the students and one for the general viewer (4.37)
- there is balance between the textual and the visual (4.31), the textual is not dominant over the visual (2.89)

	The resumes of the academics should have	**Mean**	**St Err.**	**St Dev.**
1	Information related to articles published.	**4,4160**	,06444	,72048
2	Information related to courses given	**4,5520**	,06570	,73458
3	Information related to his/her research field.	**4,4880**	,06285	,70271
4	Information related to his/her presentations	4,2720	,07307	,81692
5	Information related to their foreign language levels	4,0800	,08160	,91228
6	Their grades for examinations indicating their foreign language proficiency	3,5040	,11338	1,26761
7	Grades for academic examinations like ALES, GRE, GMAT	3,4400	,11438	1,27886
8	Information related to their membership at scientific institutions	4,0560	,08447	,94446
9	Information related to their membership at social institutions	3,6240	,09946	1,11199
10	Information related to projects they manage or participate	**4,3440**	,06335	,70829
11	Information related to MA and PhD theses they have supervised	**4,3760**	,06688	,74773
12	Information related to their age	*2,9520*	,10464	1,16989
13	Information related to their marital status	*2,4160*	,10044	1,12296
14	Information related to their hobbies and interests	3,0560	,10430	1,16608
15	Their updated photographs	3,7040	,09573	1,07030
16	Office hours assigned to meet with students accessible through the web	**4,4400**	,06947	,77668
17	Links to their publications (proceedings, article, sections in a book, books)	**4,4800**	,06584	,73616
18	Links to a mail group if there is any	**4,4000**	,06222	,69561
19	Links to the academics' membership at social networking sites	3,3760	,11565	1,29306

20	Links to the academics' membership at social networking sites	3,9760	,08833	,98754
21	the feature allowing to download them both in word and PDF format.	3,4560	,10442	1,16746

Table 6. Students' opinions of the web-based information related to their departments' instructors

Students' main priority is the updates regularly made by websites to change their content. The second highest mean score is to do with availability of two sections for both announcements and the news archive with easy access. Being aware of current announcements is necessary to facilitate the availability of up-to-the-minute information. The dimension of current announcements is closely related to updated look. With past announcements archived in a separate section, the site avoids overload of information. The items addressing the usability of email addresses and message box in the first section and the office hours and mails groups in the resume section reflect the demand on their part for teachers communicating and interacting with them.

Preference for the information-based content to the promotional indicates that students do not want their university to associate a commercial image in its pejorative sense, which, if it had, would do harm to their employment outcomes. In other words, a representation of their university is that of theirs. Enthusiasm for representation is implied in student portals as well. They suggest active, autonomous participation through which they are constructive agents of the institution of higher education. Another item to attach importance is the expressed need for an introductory video broadcast on the web site, in which the students as well as professors may be shown highlighting the advantages of their education in their university.

The item to do with English equivalence of the Turkish web site may indicate a bias as the participants are English or related majors. Nevertheless, apart from that possibility, it is a fact that many web sites do not include many important sections addressing international students and foreign academics seeking research partnership, such as announcements that might help international prospective students and other content with potential for relevancy. The translation is also deficient in terms of use of natural English, and lack of cross-linguistic equivalence for specialized terminology sometimes to the point of negative products of machine translation. Another interesting information is the availability of irrelevant content overloaded with legal terms (law number of a regulation). In the resume section, the emphasis is on the need for the following (8 agreed and 2 disagreed items out of 21):

- information related to the articles written (4.41),
- courses offered (4.55),
- their research field/interests (4.48),
- projects conducted or participated (4.34),
- Master's and doctoral theses suprvised (4.37),
- office hours assigned for meetings with the students (4.44),
- links to their publications (4.48)
- their mail groups (4.40).

These results suggest that students attach the least importance to those information pieces related to their instructors' age and marital status although some departments advertise such status the reason of which remains undisclosed. Many mean scores in resume section are expected. One of the more interesting ones is that for the item to do with Master's and doctoral theses supervised. This item is important for those keen on research or in pursuit of a research career. Besides, research makes a university a highly ranked one. In terms of competing for jobs, postgraduate education gains importance to make students stand out amongst the undergraduates, whose numbers increased.

Conclusion

Tasks related to web site development is important. According to Thelwal, Binns, Harries, Page-Kennedy, Price, Wilkinson, (2007), a university web site provides scholarly and pedagogical information. Secondly, it functions "as a marketing tool for prospective students about the courses available and the university itself. Thirdly it contains "information about the research conducted at the university, including details of active scholars, groups and projects" (Thelwal, et al., 2007, p. 95). Once indexed by a search engine, the university web site not only facilitates international collaboration of academics seeking research partners home and abroad but also introduce itself as an alternative choice for students, both home and overseas, with an international appeal. Given the steady economic growth of Turkey, the Turkish government should allocate funds for projects related to the size and quality of the web sites of

Turkish universities so that they use the Internet to have their quality identified and recognized internationally.

In the future, communicative tasks related to university web designs would encourage them to participate more actively in their learning processes. However, it is our observation that students do not participate actively in learning processes in learning English in or out of class. It is not innate, but just the way they have been socialized to study or learn. However, the more involved a learner is, the better they will learn (involvement load hypothesis, Hulstijn & Laufer, 2001). An interesting idea would be involving them as active contributors in the co-construction of the website of their school. A web task might involve learners' sensitivities to issues of discourse such as genre and register along with non linguistic features (audio and/or visual) or cognitive load embedded in the teaching materials. They could gain socilinguistic dimensions of vocabulary from this relevant kind of task-induced involvement could benefit from (involvement load hypothesis, Hulstijn & Laufer, 2001). Another point worth to make is that most of the English or related majors are women, who can contribute especially to visual aspects of designAccording to T. Franklin, professor of educational studies, instructional technology, (personal communication, may 25, 2011), women are very good at visualisation of images, which she witnessed in hiring females as designers, and they are large users of internet in any culture (except the closed ones, where their access is denied).

As for the process related to design, it can also be an imaginatively enriching experience with gift of looking at matters from different perspectives. It would be enriching in terms of the existing literature on websites as well which reminds us of Derrida's famous quote "everything is text". The web related tasks may provide job opportunities. Whether English or related majors pursue a teaching career or not media literacy is a good asset for them. One of the most important features students are the essential most active producers is student portals, which, in Franklin's words (personal communication, may 25, 2011) is the next hot thing in USA. After all, learners are expected to participate in their learning processes in US or UK school settings; it is a part of learning culture in these contexts, which is also expected of learners of English to be aware of as a part of intercultural competence. The way the questionnaire was responded suggested an idea on involvement or participation. In the case participation in works requiring multiple disciplines, our study has implications for promising collaboration of English majors with other majors professionally (professional web designers, bloggers, advertisers, journalists, etc.) as well as academically through the implementation of interdisciplinary studies or double majors (e.g. CEIT and ELT).

We hope that our study might influence English language teachers to entertain the thought of benefiting from web tasks for themselves and students. Wondering if TBLT might work for "teachers and learners in the classroom as it does for SLA research", Van den Branden (2006) underlines the lack of empirical research conducted on the use of tasks as "basic units for the organization of educational activities in intact language classrooms in intact language classrooms" (p. 1). Whether web development tasks may be evaluated in classrooms effectively in task-based language teaching approach (TBLT) may be investigated in future research, though we should be aware of the distance between rhetoric and the realities, as Nunan is reported in Feeney's book review (2006) to cautions us against in comment on the increase on the number of the textbooks based on TBLT.

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ENTERPRISE KNOWLEDGE PORTALS AS A KNOWLEDGE NETWORKING SYSTEM

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ABSTRACT

Knowledge portals are a key ingredient in today's organizations strategy for success. It is the right tool for knowledge sharing, storing and retrieval by all organizations stakeholders. Enterprise Knowledge Portals as a knowledge networking system allows organizations to become more competitive, innovative and prosperous. Knowledge management as a term by itself cannot achieve the results designed by top management without the actual implementation of Enterprise Management Systems/Portals. This paper discusses the use of EKP as a new knowledge networking system.

Keywords: Knowledge Management, Enterprise Knowledge Portals

INTRODUCTION

Many researchers, economists, politicians and businessmen are referring to today's economy as "knowledge economy" reflecting a shift in trend for organizations from relying on information to make decisions to relying on knowledge as vital component for organizational survival and success. Knowledge economy as a term also implies that today's organizations has a continuing quest for knowledge that is needed in their daily operations. Although it is information that is at the center stage of everyday activities at organizations, knowledge remains the ultimate goal for employees, top management and decision makers. This accumulation of information over time becomes explicit and implicit knowledge stored in the learning organization. Knowledge accumulation and use needs a knowledge management system to support the "creation, capture, storage and dissemination of information" (Akscyn, Robert M., Donald L. McCracken and Elise A. Yoder 1988). The Internet has played a major role in building a huge database of accumulated information that is ever growing in size and content. In November 2004 Google has announced on its company's website that it has indexed 8 billion web pages (Google Website 2004).

The Internet technology prompted organization to use a modified version of the Internet; this led to the introduction of the Intranet in the organizational settings. The Intranet allowed the fast and convenient sharing of company information among employees (SearchWinDevelopment.com) from the office or home. For many corporations an intranet is seen to be the way in which employees would have access to company's information and expertise and to work collaboratively (White 2000).

Organizations over time learned how to balance the access of information for both internal and external use (White 2000). Today, organizations deploy Intranets and extranets to allow its employee easy access of company's information through its firewalled Intranet and at the same time allows suppliers, vendors and stakeholders secured access to its production data through its Extranet networks.

The overwhelming amount of information available at a company's web site requires continuous amendments and updates and this led eventually to the development of Content Management Systems (CMS). CMS are web applications designed to make it easy for non-technical users to add, edit and *manage* a website (The Plone Foundation). There are many CMS providers out there, some of them provide the system for free and some charges a modest fee to download and use their software. Wordpress.org is considered one of the notorious free CMS software that is used globally by millions of users (http://wordpress.org/).

According to (Reneker and Buntzen. 2000) Organizations are building and identifying strategies to enhance the "intellectual capital of the organization's workforce". This implies paying attention to the use of knowledge management systems and portals within the organization and disseminating knowledge

about the strategic benefits of knowledge management systems for "decision making" (White 2000) and strategy formulation.

Currently the US government is focusing its efforts to bring the "librarian's professional knowledge and expertise to stand on integrating electronic library and information services with rising knowledge management (KM) practices". (Reneker and Buntzen. 2000) Many organizations are following this norm form large to small all over the world. This requires a complete and comprehensive change management approach to allow and guarantee that all individuals within organizations shall grasp this new technological and managerial change.

Knowledge management systems are becoming a knowledge portal and therefore replacing the old concept of information portals. After all it is knowledge what organizations want. Today's large and multinational organizations are using Enterprise Knowledge Portals to manage all their organizational need for knowledge and information. The Enterprise Knowledge Portal is being designed to provide a single point of entry to key information and knowledge resources for managers, employees and external stakeholders.

KNOWLEDGE PORTALS EVOLUTION

Portals evolved over the years to what we know today as Enterprise Knowledge Portals (EPK). In the early days of the Web, portals were merely a collection of disassociated websites (Altman 2007). They were used to "consolidate corporate intranets and to provide single sign-on to back-end applications and database systems" (Colin White 2007). Such systems are still in place today by some small and medium size organizations and are used by their employees on a daily basis. An example of such early day portals are the web enabled Grad Reporting Systems at universities and the HR Employee Attendance Systems utilized in most organizations. Such systems have a user log to record all users' activities on the system for administrative review and to monitor employee's actions and evaluate their performance on a daily, monthly and yearly basis.

Online portals later evolved into online systems that included access to almost all organizations internal applications such as accounting, marketing, inventory, human resources, and finance. Thereby users can access their company systems and perform all the required transactions both form office and home. They would also find information about other business departments through the centralized database over which the system is running on.

Today's portals provide employees a "single sign-on and access to back-end applications, business information, and also other portals in the organization" (Collins White 2007).

Systems and business developers relying on new business flow methodologies started building portals that are connected to back-end systems and thereby providing employees with the advantage of using portals that are "business process-driven, rather than data-driven as in older portal designs" (Collins White 2007).

WHAT IS ORGANIZATIONAL KNOWLEDGE?

In plain and simple language we can define organizational knowledge as knowledge stored and used by organizations to support their daily activities and decision making process. Traditionally knowledge is categorized into two types Explicit Knowledge and Tacit Knowledge (Edvinsson and Malone 1997). Explicit knowledge can be expressed in words and it is easily shared and transferred from one person to another. It is available in books, manuals, papers, and all type of printed or viewed multimedia such as YouTube.com and other online and offline Encyclopedias (Nonaka 2002).

Tacit knowledge on the other hand is hard to transmit or transfer to others since it is hidden within the person head and it is difficult to retrieve and it is "deeply rooted in an individual's action and experience, as well as in the ideals, values or emotions he or she embraces"(Edvinsson and Malone 1997).

Organizational knowledge resides within the heads of the employees and the management of the organization. It is easy to archive Explicit Knowledge but it is by far the most daunting task to retrieve Tacit Knowledge from employee's heads and store it in a database repository. Knowledge management systems evolved into Expert System to store and retrieve the knowledge of experts for future utilization.

Kevin Marshall states in his 2008 paper that "Knowledge sharing is a driver for innovation, improvement of operations, and ultimately, success. Businesses will soon need to adopt the technologies that make knowledge sharing most effective in order to stay competitive" (Marshall 2008).

ORGANIZATIONS KNOWLEDGE AND THE INTELLIGENT ENTERPRISE

Intelligent enterprise refers to the use of information technology by organizations to achieve competitive advantage. According to (Quinn 1992) intellect is the core source in producing and delivering services. Organizations are aligning their business strategies with the strategies of their IT departments to achieve what is known as Business Intelligence (BI) practices. Business Intelligence is combining the use of "applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions" (SearchDataManagement.com).

It is through the use of Business Intelligence practices that organization becomes what is called an Intelligent Enterprise. Organizations use BI to analyze business data and information to achieve higher return on investments and to survive in today's highly competitive economy. BI aims at providing better decision making process through the use of business analysis tools and applications such as online analytical processing and data mining software.

Business intelligence depends heavily on information stored in organizations databases and data warehouses to produce the right knowledge needed by decision makers at the organization to make the right decision at the right time. The source for such information comes primarily form information portals and knowledge portals. Today, information portals come equipped with streaming video and audio and include e-learning and e-training applications and tools.

ENTERPRISE INFORMATION PORTALS

Enterprise information portals is the use of organizations website to become the gateway to a company's information and knowledge base for employees and possibly for customers, business partners, and the general public as well (SearchSAP.com).

Firestone (2002) defines EIPs as "applications that enable organizations to extract tacit and explicit information within the organization, and provide users a single doorway to personalized information needed to make intelligent business decisions". Enterprise Information Portals (EIPs) were introduced by Christopher Shilakes and Julie (Shilakes 1998). Also Weinsteing (2002) defines Enterprise Information Portals as "amalgamation of software applications that consolidate, manage, analyze and distribute information across and outside of an enterprise".

Enterprise Information Portals provides organizations with new tools and applications to achieve a competitive stand in today's agile economy. Firestone (1999) defines this competitive advantage as resulting from "the competitive potential lying dormant in the information stored in enterprise systems". Firestone and Shilakes also imply that this shall lead to organization growth that is "being driven by three basic benefits provided by EIP systems (Shilakes and Tylman 1998).

EIPs are also easy to maintain and to develop since they rely on Internet and Intranet technologies. It is different than old client server applications in the sense that they only need to be resident on the server side of the network and that all updates and modifications to the system are only done on the server. Users on the other hand have nothing to do with how the system works and they don't need to worry about installing the system on their client machines or updating the system every now and then.

EIPs benefits also extend to the organizations employees by increasing their productivity and lowering the amount of time employees spend looking for information on the Internet (Plumtree Software 2001). Employees can access and receive information on their laptops of office machines efficiently and with ease. It is a one stop shop for an employee, customers, vendors, suppliers, and major stakeholders Wayne Eckerson (1999).

Being a one stop shop EIPs allowed customers to get what they want from an organization web site or portal in a simple and easy manner. This in turn is translated into customer satisfaction and later on into customer loyalty. Organizations are becoming more customers centric in the sense that organizations understand that in order to be competitive and survive they need to build customer loyalty and this is difficult to achieve unless they provide their customers with all the information and services they want promptly.

According to (Firestone 2002) there are four benefits for EIPs "ROI, competitive advantage, increased effectiveness, and accelerated innovation". Although there are several advantages for employing EIPs in organizations they fall short of providing a true collaborative and communication platform for organizations to become intelligent. Collaboration is important to support decision making and to bring new ideas to the organization through interactive brain storming. The next step for EIPs is to evolve into Enterprise Knowledge Portals by enhancing the "quality/validity of information supplied by the portal" (Firestone 2002).

ENTERPRISE KNOWLEDGE PORTALS

The Enterprise Information Portals evolved over time into what we know today as Enterprise Knowledge Portals (EKP) that are influenced by the goals of Knowledge Management (Grammer 2000). They inherited EIPs functionalities and they also integrated access to expertise and embedded applications functionalities (Grammer 2000).

In reality one may not be able to distinguish from start if the application he is using is an EKP or EIP. Both portals provide information about the organization and its products, services and operations. It also provides "collective services such as security, metadata repository, personalization, search, publish/subscribe," Wayne Eckerson (1999) they also mimic the general layout and look of a portal user interface (Firestone 2002).

Knowledge portals contribute to the success of the enterprise knowledge management systems. They provide users with a unified platform for the access and retrieval of vital information residing on the company's website and web enabled applications. They are considered a knowledge management networking system for organizations.

In theory EKPs are a perfect solution to knowledge management systems in organization, but the real world implementation shows that these systems lack a major contributor to the continued success of knowledge management systems and that is real time online collaboration. "It is not surprising that there is now a perceived need for better collaboration between knowledge workers across organizations" (Marshall 2008).

WEB 2.0 AND ENTERPRISE KNOWLEDGE PORTALS

The use of social networking software generally referred to as Web 2.0 applications shall contribute to the increased level of collaboration among employees among themselves and with external parties such as customers, vendors and suppliers. According to Marshall Web 2.0 is made possible with the use of key open standards, flexible, and ever changing technologies such as AJAX, PHP, SOAP, CSS, and APIs (Marshall 2008).

Web 2.0 applications such as Facebook.com, MySpace and Twitter has made it possible for a person to interact with several people online using one application. These systems provide chatting functionalities in addition to real time collaboration functionalities that are gravely needed by today's enterprises. It is no wonder that most businesses has started to create their own groups and pages on these social networks. They perceive it as a reliable means to reach customers and employees from one location.

CONCLUSION

Knowledge portals are a key ingredient in today's organizations strategy for success. It is the right tool for knowledge sharing, storing and retrieval by all organizations stakeholders. Enterprise Knowledge Portals as a knowledge networking system allows organizations to become more competitive, innovative and prosperous. Knowledge management as a term by itself cannot achieve the results designed by top management without the actual implementation of Enterprise Management Systems/Portals.

Knowledge Portals provide a viable knowledge setting to a large number of users and organizations. It is clear that EKP are the new knowledge networking system among large, small and medium size organizations.

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Evaluation and Design of a Context-Awareness Interactive Digital Artwork

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ABSTRACT

Digital art is regarded of more and more importance in various kinds of performance arts nowadays. Not only do the performers have more performing forms, but the audiences also receive the performing messages from the stage in completely different ways as compared to before. Moreover, the performers and the audiences can do the interaction with each others. In this paper, we try to establish an interactive system to control the lights of the stage. We wish the user can use the system to create their own stage by themselves. This study is aimed to explore the following concerns:

(1) Which parameters will be set in the programming when the sensors read different music?
(2) After finishing the programming and sending the instruction to the hardware, how to present the light effects?
(3) Can the light effects in real time make the user truly feel that they create their own stage?
(4) Does the system provide good interaction between the user and the system?
(5) Does the user feel satisfied about the system?

The experimental results show that the user can enjoy the interaction by his own way and create different light effect with the music. At the same time, the users believe the system can became more useful and expandable and feel satisfied. Through this research experience, we can understand the interpretation of "Interactive Artistic". The narrow sense refers to the audience's personal participation shows the whole concept of art, a broad sense, we view the process of the audience who sees, identify the concept of mind, and convey the conception as an interactive act.

Keywords:
Human-Computer Interaction; Digital Art; Context Awareness; Interactive Art; Usability Evaluation; Interaction Design

INTRODUCTION

Most traditional art is unidirectional. That is only the audience gets the message from the author. And because of the personal reason and experience everyone get the work levelly. But digital art create a new world by using technology. Especially is interactive art which turn the audience to the author. How does it link the user and the work successfully makes us want to know more. We can find that the recent performances are not just excellent singing and dancing. The performance is also use some special effects like varied light or projection on the stage with the background which is composed of big screen with changing image. The way of using new media on performance motivated us to explore the following things: Can we control the stage light just by sound detection and user directly manipulating but not default setting to create personal work of stage light? It means even using the same song, but different users can get different effects by themselves.

"Digital Art" is the word "Techne" that from the ancient Greek. It refers to arts, skills, crafts, and so on (Luo et a;., 2009). In the process of creation, if the arts were created in digital forms, and methods, that is called digital art. When the traditional forms of arts were recreated by digital methods or tools, it can be called art-digitization. No matter what type of creations, they all can be known as digital art (Hsieh et al., 2010). The difference between the digital art and the traditional art is not the change of the creative spirit, but the use of

digital technologies. Therefore, digital art is that can be shown in the way of digital or together with other technologies to display in various ways (Chen, 2009). In these diverse creations, the influence and change of the science and technology can be seen. We also look forward to the science and technology that progress continuously can lead the digital art into a more brilliant future (Yeh, 2003).

We also want to know more about happening which increase more fun on interactive art. People cannot expect what will happen next, and the surprise just show up. By interacting with the system, we not only brand new things to the same performance, but also wish that the user can get the message about treat the same thing in different sight. The critical factor that transforms unidirectional traditional arts into two-way digital art is the appearance of new media arts. New media arts bring a new way for artwork creation. But is technology really everything? When we enjoy the convenience from technology, didn't we lose some sensibility? By using the system we wish the user can enjoy the changing environment of the light and jump out of the stereotype, just try to feel the relationship between user and the world. We will discuss following questions in this paper:

(1) Which parameters will be set in the programming when the sensors read different music?
(2) After finishing the programming and sending the instruction to the hardware, how to present the light effects?
(3) Can the light effects in real time make the user truly feel that they create their own stage?
(4) Does the system provide good interaction between the user and the system?
(5) Does the user feel satisfied about the system?

LITERATURE REVIEW

In "The End of Art" (Danto, 1998a, 1998b), Arthur C. Danto stated that the function of art imitation and reappearance had disappeared. The emphasis on verisimilitude imitation was also redefined in art history (Oliver, 2003). This redefinition included concepts such as having the text be writable and created by readers. Moreover, readers, rather than authors, interpret the meaning of the text. This redefinition is the known as the "writable text" concept (Zucker, 1997).

Interaction is an important characteristic of digital artwork. Nevertheless, the evolution of the esthetic viewpoint is seldom mentioned. Participation is essential in the creation of artwork. It gradually forms a kind of esthetics based on interactive design. The concepts discussed here are crucial in new media art (Kirk & Gopnik, 1990; Manovich, 2001). Using the computer programs to drive the object around, so that the works of art can interact with the audience. And making the original passive single law of inertia between the creations and the audiences become a community of interactive (Ye, 2000).

The major difference between the digital interactive arts and the traditional arts is that you can let the audience to join the creative process, allowing viewers to create their own world by full use the freedom of digital. Margret Elisabet Olafsdottir, curator at The National Gallery of Iceland argues that interactive art's main objective is to have the spectator actively participate in the creative process. Participation was supposed to stimulate the audiences' creativity as instead of standing in solemn contemplation. This concept is contrast obviously with the traditional arts (Zhang. 2007). "Interaction" makes works of art is not just a one-way creators' tell, the audience is no longer a passive listening. It becomes a dialogue, a two-way communication between the people and the arts.

The most characteristic about digital art is combine technology and use technology to create art. The more technology progress, the more variety can be show on. Using technology to create art work can help artist present the creativity more vivid. And art work has to express the affection directly. Moreover, should inspire deeply thought. So the work can cause the viewers' feedback in mind. Creative work should be open process but not closed, structured or limited (Lin & Fan, 2004). If you add some interactive elements into the work, then you can create a richer interaction between the viewer and the work. And make the relationship between "creator", "audience" and "work" complicate, for example, creators may become the viewer, but the viewer may become creators, and then generate a new route (Lin & Fan, 2004).

DIGITAL ARTS PROGRAMMING

Miller Puckette and other designers have developed Max / MSP at IRCAM in Paris since 1988. At the beginning, they started from the control of sound, now has been combined with images and interactive capabilities. As for the technology, it is a specialized art programming language, which is a comprehensive set

of development kit to use drag components as part of the program (Cheng, 2004; Lin & Li, 2008). Max/MSP/Jitter uses the software to control the connection between many audio and video hardware of computer, such as sensors, MIDI equipment, sound playback, video output,etc. Max is responsible for controlling the messages between MIDI; MSP, for Audio controlling; Jitter, efforts to dealing with static and dynamic images. Among them, Max is the controlling logic of the core process. Consequently, to learn MSP or Jitter, leaners must first have the foundation of Max. (Cycling74, 2011; Cheng, 2004; Lin & Li, 2008).

Cheng thinks: "This system has made progress from the original MIDI controlling functions (Max part) to the immediate processing of voice message (MSP part) in recent years. This has shorten the distance between composers and computer music technology. And it even devoloped to integrate real-time image processing (Jitter plugin). The role of computer in the musical works' roles and functions has aready changed from sound editing, musical instruments, sound simulation, and further into the role of a jam (Cheng, 2004; Lin & Li, 2008; Toner., 2006).

The Arduino is an open source Simple I / O board, as long as we write codes within a integrated-development environment, and use the program to control the Arduino board, and burn it into the chip (microcontroller) of the Arduino board in the end, the link can be developed through the bread plate to complete the electronic components such as Switch, sensors, controllers, LED or other output devices. It also allows Arduino and the electronic components linked with it work independently as an interfaces with other software program (Arduino.TW, 2008).

Having this in mind, we use Cycling '74 Max / MSP / Jitter 5 with Arduino to develop and design an installation system in this study. When users interact with the installation, the system will capture the audio and sensor values, and input the codes we design, and then users can get the feedback as flashing lights in order to reach the stage of writing personal and exclusive research purposes. Refer to the system architecture diagram in figure 1.

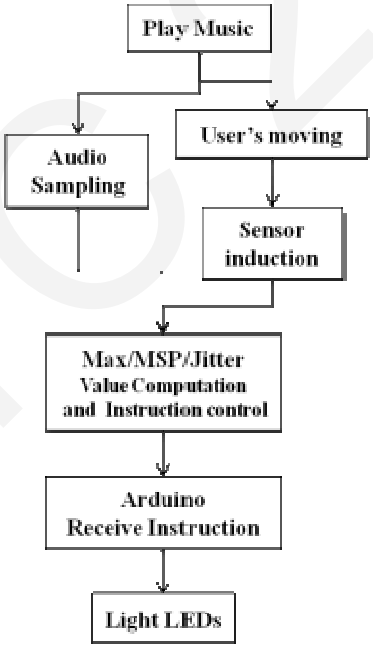

Figure 1: System Architecture Diagram.

RESEARCH METHOD

We mainly study the volume and pitch of the music. When we play the music, the Max/MSP can analyze the audio by using its build-in objects. We use the object of peakamp~ to capture the max value during a

certain period of time. The object of pitch~ is used for detecting the hertz. After calculating the parameter, we can get the audio value which will be used later.

We will use different sensors to do the test, such as pressure sensors or buzzers. As the user dances with the music, the sensor can detect synchronously the pressure during the operating time, and transforms it into a useful value. Next, the system will combine the value with audio value and operate the two values. After that, system will send messages to Arduino according to the variations of the values. In the end, the user can interact with the system, triggering multiple LEDs by using different ways. The system of flow chart presentation is shown in figure 2.

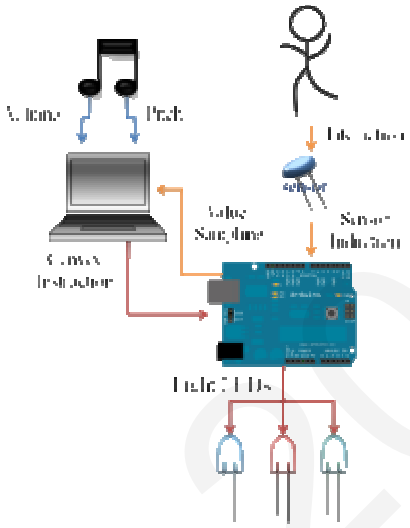

Figure 2: The flow chart to control LEDs.

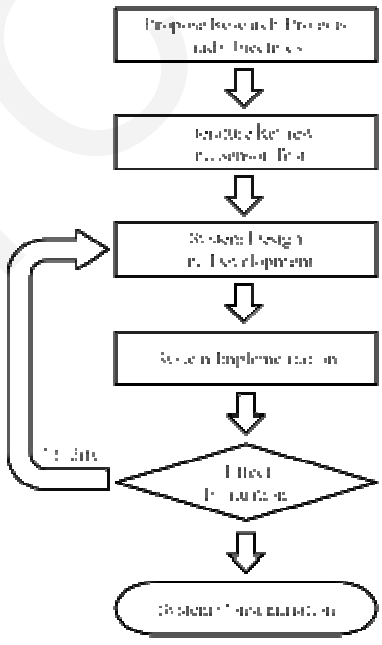

Figure 3: System construction flow chart.

Research Processes

As introduction about software and hardware before, this research will develop the system step by step like figure 3: (1) Use Max/MSP to get the parameter about volume and pitch of the sound which the research need. (2) Choose different sensor to take a test and use Max/MSP to analyze the parameter. (3) Use the parameter we got before to execute the program. After evaluated the parameter, program makes the LED reaction finally. (4) Do the questionnaire about the system. Then improve the system in according to the analysis of the questionnaire.

EXPERIMENTAL RESULTS AND ANALYSIS

After the system finished, we invite 35 users to play it and fill 3 questionnaires which are System Usability Scale, Questionnaire for User Interaction Satisfaction (QUIS, 2006), Interaction and Satisfaction Scale. And we interview 5 users from them. The whole process is depicted in figure 4.

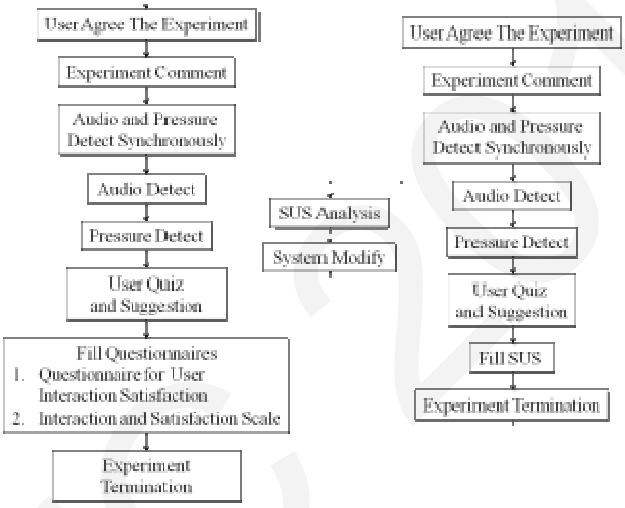

Figure 4: Experiment flow chart.

First, we introduce our system to the user. We only use the sound detection to control the system. Just show them the system is reacting in real time but not setting before. Second, we let the user try to control the system by directly manipulation without sound detection. Finally, we encourage the user to interact with the system by directly manipulation with the sound detection. In the end, the users fill the questionnaires and some of them accept the interview.

User Satisfaction Analysis

Among the 35 participants, there are 4 younger than 19 years old, 29 between 20 to 29 years old and 2 between 30 to 39 years old. 13 were female, and 22 were male. Table1 shows that most people have experience about digital art work before this time.

Table 1: Experience about Digital ArtWork

How many times have you interacting with digital art work before?				
None	***Once***	***Twice***	***Three times***	***More than three times***
4	4	9	5	12

System Usability Scale

The SUS is a questionnaire to estimate users' subjective feelings and their degree of satisfaction with regard to the system. Concerning usability evaluation, the SUS is an efficient, time-conserving, and labor-saving way of gaining a subjective estimate, and it is widely applied to system usability. After users answer ten questions, the scale transforms the subjective feelings of the users into objective data for analysis. That is, a score on the SUS is used to evaluate the usability of the system. The range of estimate scores is from 0 to 100. The higher the score, the more useful the system is and the more easily users can interact with it (Brooke, 1986; Tullis, 2004; Lutes, 2006; Isman, 2010; Hsieh et al., 2010).

Table 2: Descriptive Statistics of SUS Questionnaire

N	Mean	Median	Min	Max	SD
35	71.1	70	35	92.5	13.5

From table 2 we know that the mean SUS score is 71.1, the median is 70, the minimum and the maximum is 35 and 92.5. The scores mean the system is usable and valuable to continue developing.

Table 3: SUS Questionnaire and Statistics of Each Item

	System Usability Scale	Mean	SD
1.	*I think that I would like to interact with this work*	2.14	0.99
2.	*I find the work unnecessarily complex*	3.03	0.91
3.	*I suppose the work is easy to use*	3.23	0.86
4.	*I think that I would need the support of a technician to help me use this work*	2.60	1.18
5.	*I find the various functions in this work are well integrated*	2.43	0.87
6.	*I suppose there is too much inconsistency in this work*	2.57	0.90
7.	*I would imagine that most people may learn to use this work very quickly*	3.17	1.08
8.	*I find the work not very user-friendly*	3.26	0.77
9.	*I feel very confident while using the work*	2.94	0.86
10.	*I need to learn a lot of things before I can get used to this work*	3.09	0.10

Table 3 is scores about SUS questionnaire and statistics of each item. The 8th item gained the highest mean. And the 2nd, 3rd and 7th items also gained higher scores. It indicated that most users felt the system easy to use. The most important is that participants are willing to accept and use this system. The system has potential for installation arts use.

Questionnaire for User Interaction Satisfaction

Questionnaire for User Interaction Satisfaction (QUIS., 2006) is provided from Human-Computer Interaction Lab. Score users' satisfaction with the view of user interface. The content of the questionnaire can adjust for the research. Our research concentrates on the response about manipulating the system and the scene about present the light effects. A 7-point scale ranging from 1 as strongly disagree to 7 as strongly agree was used for the measurement (Preece et al., 2007; Likert., 1932).

Table 4: Descriptive Statistics of the response about manipulating the system

Question Items	Mean	SD
Simple to Use	5.63	1.20
Easy to Use	5.34	1.33
Great	5.23	1.22
Multiple	4.94	1.45
Interesting	5.03	1.52

Question Items	Mean	SD
Efficient	4.77	1.17

According to table 4, each items get the score higher than 4. It means the user felt satisfied about the system. But the efficient about the system get the lowest score. Because some users felt they cannot make sure about either they control the light up or the music did. The interesting about the system gets the highest SD. We found that some user enjoyed the interaction with the music and touch the sensor in their mind. They were success to interact with each other. But the other just focused on the changing light. They do not care about the music. So they feel bored about just saw the light. Table 5 shows that the participants gave mean score higher than 4. It means the participants feel satisfied about the light

Table 5: Descriptive Statistics of the scene about present the light effects

Question	Mean	SD
Multiple LED	5.29	1.32
Colorful scene	5.20	1.19

Interaction and Satisfaction Scale

About the Interaction and Satisfaction Scale, we use Likert scale to score the system. A 7-point scale ranging from 1 as strongly disagree to 7 as strongly agree was used for the measurement. 1 mans terrible, 4 means no judgment and 7 means satisfied. Table 6 tells us about the Interaction and Satisfaction of the system. Besides the inspiring, the other got the score more than 4. Most users can not be inspired in their mind through the interaction (Chin, et al., 1988; Harpe, 1993; Ives et al., 1983).

Table 6: Result from Interaction and Satisfaction Scale

Question	Mean	SD
Challenge and Curiosity	4.63	1.17
Inspiring	4.00	1.04
Satisfaction	4.74	1.10

CONCLUSION AND FUTURE WORKS

Through this research experience, we can understand the interpretation of "Interactive Artistic". The narrow sense refers to the audience's personal participation shows the whole concept of art, a broad sense; we view the process of the audience who sees, identify the concept of mind, and convey the conception as an interactive act. However, the implementation of the whole plan, not just a professional academic research and presentation of digital art, we also hope that this system can be effectively utilized in the commercial sector or entertainment career. In the future, this research work to further the development to the video presentation, by using the capabilities of Max/MSP which can combine the videos and interaction, it can generate a random drawing out of nothing. And then, we can cooperate with the stage design cooperation; through more powerful hardware support, this work of art features and effects will reach more extreme play. We believe in the stunning and unique backdrop of lighting, not only show the professional performer's perfect performance, but also let the audiences feast their eyes on the scene.

ACKNOWLEDGEMENTS

The authors would like to thank the National Science Council of the Republic of China for financially supporting this research under Contract No. NSC 99-2511-S-024-005, NSC 98-2221-E-024-013, NSC 98-2631-S-008-003 and the anonymous reviewers for their valuable comments.

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EVALUATION OF ELEMENTARY SCHOOL WEBSITES

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ABSTRACT

In the study, it is aimed to evaluate current position of elementary school websites. Study is carried out by investigating elementary school websites in central districts of Konya province in 2009. "Evaluation Form" consists of 4 items in "School Management" category, 13 items in "School Information" category, 7 items in "Staff Information" category, 6 items in "Student Information" category, 5 items in "Lesson Information" category, 8 items in "Activity Information" category and 18 items in "Web Features" category and in total 61 items. As a result of study, it is found that nearly half of the elementary schools bound to central districts of Konya province don't have websites. It is observed that "Student Information" and "Lesson Information" sections of elementary school websites are so poor and other sections are at medium level.

Key Words: elementary school, school, website.

SUMMARY

PURPOSE AND SIGNIFICANCE

It is observed that elementary school websites differ from each other by their content and design. In this study, evaluation of elementary school websites is aimed. In accordance with this general aim, elementary school websites are taken into investigation in terms of "School Management", "School Information", "Staff Information", "Student Information", "Lesson Information", "Activity Information", "Web Features". Moreover, it is investigated whether elementary school websites differ according to district that they exist.

METHODS

Working group of the study consists of National Ministry of Education – Konya Provincial Directorate of National Education, elementary schools within Karatay, Meram and Selçuklu County Directorate of National Education. Study took place in November and December 2008. Websites of 105 Elementary schools which are bound to County Directorate of National Education were accessed. "Evaluation of Elementary School Websites" measuring device was developed for the study. Opinions of consists of students from Department of Computer and Teaching Technologies Training who are going to work as Informatics Technology Teacher in elementary schools, elementary school teachers, students and 12 individuals consists of students and curators are taken. Gathered data is analyzed and submitted to expert opinion and 61 items measuring device is developed. Items of this measuring device; 4 about School Management, 13 about School Information, 7 about Staff Information, 6 about Student Information, 5 about Lesson Information, 8 about activities held and remaining 18 about Web Features.

RESULTS

105 (45%) of 232 elementary school websites in central districts of Konya Province were accessed. No data about lessons that students take were found in 72% of elementary school and no data about students were found in 55% of elementary schools. It is observed that there is not enough data on school management, school information, staff information and activity information in elementary school websites. Elementary school websites didn't differ according to the place where they exist.

DISCUSSION AND CONCLUSIONS

All of the school websites were not accessed, since there is no obligation for schools to have a website. Presented data in websites are comparatively insufficient in terms of "Lesson Information" and "Student Information". These reason that preparation of "Lesson Information" and "Student Information" is extensive and tiring; school managers, teachers and students want to hide their personal information and those data required to be updated frequently can be the reason for sharing those data in websites insufficiently. Even if "School Management", "School Information", "Staff Information" and "Web

Features" of elementary school websites are not in desired level, they are partially shared. In accordance with those results; it is suggested that web broadcasting teams should be organized in order to prepare websites for elementary schools without websites, more extensive standard contents should be organized by MNE for required qualities in elementary school websites and there should be more comprehensive data about "Lesson Information" and "School Information". Researchers were advised to research in terms of identifying that school website data differs according to what variables and asking for students and curators' opinion on what should be included in school websites.

EVALUATION OF STUDENTS BEHAVIOR UNDER MOODLE USING DATA MINING TECHNIQUES

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I. ABSTRACT

There is a big need for evaluating the effectiveness of the emergent technologies in educational environments and their contribution in achievement of the educational institute's goals. Course Management System (CMS) is one of these technologies which is used in knowledge transfer and management. It is a rich and confidant data source about student's behavior. The aim of this paper is to analyze this behavior for evaluation purpose by extracting useful knowledge from applying data mining techniques on the generated logs from this system.

Index Terms—E-learning, Educational Data mining, Course Management System

II. INTRODUCTION

Data mining is an increasingly important technology nowadays and its application is expanded to many valuable sectors in our life.Its success is proven in decision support and evaluation processes by extracting the useful knowledge from industrial, civil, medical, commercial as well as educational data bases. Educational Data Mining (EDM) has emerged as an independent research area in recent years, culminating in 2008 with the establishment of the annual International Conference on Educational Data Mining, and the Journal of Educational Data Mining **(Baker, 2009)**.Many educational institutes realize the importance of E-learning systems as an advanced way for the knowledge transfer for purposes of education and training.These systems can represent a rich source of educational data and provide complete and meaningful records about the student's behavior. These records are stored in learning management systems as separate logs attached with each course and track each student enrolled in the on-line course. One of these powerful learning systems is MOODLE (Modular Object-Oriented Dynamic Learning Environment) which is a Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). It is an open source application that educators can use to create online learning sites **(http://moodle.org/about/)**.Moodle gives the instructorsand students the ability to overcome the limitation of course time and place, the instructor can design many e-activities such as (e-quizzes, e-assignments) and upload useful supportive e-resources through Moodle. The students can get benefits from them any time in any place. As any CMS Moodle stored the students logs which can be useful for evaluation process. This paper apply data mining tasks such as association rules, classification and clustering techniques on Moodle logs to show the effectiveness of using data mining for students behavior evaluation. The following sections are structured as follows: the next section scan some of the related works in EDM domain, the third section talking about the first step in data mining process, the next three sections show the results from applying association rules, classification and clustering techniques respectively, finally the last section draw the conclusion, recommendations and future works.

III. RELATED WORKS

Many researchers contributed in the emerging discipline EDM. El-Halees extracted knowledge that describes the student's behavior by applying association, classification, clustering and outlier detection techniques on Moodle logs **(El-Halees, 2008)**.The authors in **(S Erdogan, 2005)** clustered university students according to their characteristics; they applied a K-means algorithm to form five clusters. Luo and his research group proposed improved association mining rules to meet the personalized needs of e-learning, they established data cube with three dimensions separately which they are learning behavior patternsdimension, learner's personalitycharacteristics dimension, and time dimension, then they applied Apriori algorithm on that cube to generate irredundant rules, after that they test the performance of the improved method by applying it on E-learning, the results show that the algorithm was effective **(Luo, 2007)**.Ribeiro and Cardoso used semi

supervised and supervised learning techniques, such as, neural networks (NN) and Support Vector Machines (SVM), to build prediction models able to track student's behavior. They depend on weblog-based framework to analyze the navigational behavior from student's logs in a Moodle. An important feature of this framework is that extraction of behavior is achieved by buildingselective models of pattern mining.The results show the model is able to successfully predict student's final outcome while bringing useful feedback during course learning **(Cardoso, 2008)**. A decision tree model is established by using J4.8 algorithm on the Weka platform the authors collected the students' learning behavior data and analyzed them. Then, they studied the relationship between learning behavior and learning effect, their model is assessed and the accuracy rate of it can reach almost 86.7%. They recommended their method proposed to be used in E-Learning evaluation system to evaluate students' learning behavior **(Lingyan, 2010)**. Zhou employed data mining algorithms to discover patterns which characterize learners either across session or groups based on their study choice and goal orientation. He used sequential pattern analysis of log files generated by university students **(Zhou, 2010)**. EDM was introduced in a theoretical and practical way in **(Cristóbal Romero, 2008)**, they described the full process for mining e-learning data step by step as well as how to apply the main data mining techniques used, such as statistics, visualization, classification, clustering, association rule mining, pattern mining and text mining of Moodle data.

IV. Problem Statement and Data Collection

Moodle attracts many instructors to use it as a tool to manage their courses and to get benefit from the facilities which it provides for enhancing and reinforcement of the weak performance of the students who need additional supportive materials. In education faculty in Islamic University of Gaza IUG Moodle was used as assistant tool in teaching a course held at the second semester of 2009/2010. During the course period the instructor monitors the students' performance and when the case indicates that there is a weakness a new supportive e-resources, e-quizzes and e-assignments were uploaded to Moodle. The goal of this paper is to examine the feasibility of choosing Moodle to achieve the educational goals.We applied some of well-known data mining techniques to evaluate the interaction of 275 students who registered in the previous course with Moodle. These techniques used to measurethe effect of this interaction on their grades. The source of data was Moodle logs for these students. In addition we got academic data about them such as the student's level, specialty and the GPA. Moodle logs were the students grades in six e-quizzes, three e-assignments as well as the midterm and final marks, also if the student get benefit from the e-resources or not.

V. Data Preprocessing

Before applying any preprocessing method we need to merge all the data sheets in one sheet, so it will be easier to import these data in data mining tool. Then for each column we perform the required preprocessing methods to make it suitable and ready for mining tasks such methods can be as discretization the numerical values into categories. We transformed the student's grades into understandable categories (excellent, very good, good...etc.). There are several data mining tools which provide the ability to preprocess data and visualization them before performing mining tasks, we used Rapid Miner **(http://rapid-i.com/component/option,com_frontpage/Itemid,1/lang,en/)** which is an open source data mining tool to draw a visualization graph between the final grade and the e-resources. It shows that excellent grades increase when the supportive e-resources increase.

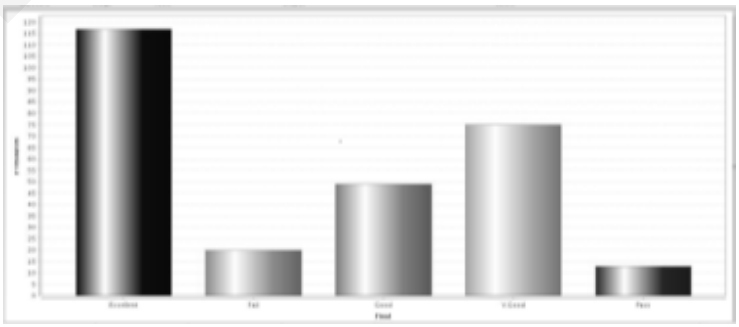

Figure 1:Visualizing the relation between the final grade and supportive e-resources

VI. ASSOCIATION RULES

The goal of mining the association rules in any data is to find the correlations between items. It is one of the most important data mining techniques used today and is a mature field of research in the future (**C**eglar, 2006).The generated rules are in form *if premises then conclusion* where *premises* and *conclusion* are itemsets. There are many interestingness measures of association rules. We use the *Confidence* and *Lift* as evaluation metrics to measure the interestingness rules generated by FP-Growth algorithm. The strength of the rule X⇒Y is measured by confidence metric which is the ratio of the number of transactions that contain X ∪ Y to the number of transactions that contain X **(Huebner, 2009)**.Lift metric is a measure of the probability of finding the conclusion in any random transaction; it measures how well the associative rule performs by comparing its performance to the "null" rule **(Marakas, 2003**). With lift metrics we can know the importance of the association rule, when its value is greater than one it shows the higher positive relation between premises and conclusion. Figure 2 shows some of interesting rules about the students grades in Final, Midterm, TAssG (Total Assignments grade) and TQG (total quizzes Grade). It is easy to notice that better grades achieved when the student get benefit from the e-resources and perform six e-quizzes and three assignments. The worst grades resulted of the bad interaction with Moodle activities; such association rules help theinstructor to evaluate how much the e-supportive materials are useful and helpful to get better achievement in the course.

Premises	Conclusion	Confidence	Lift
GPA = Good, MidTerm = V.Good	Final = V.Good	0.515	1.882
e-resources = no, GPA = V.Good	Final = Excellent	0.686	1.607
GPA = Good, e-resources = yes	MidTerm =V.Good	0.5625	1.363
#Q = six	MidTerm = Excellent	0.672	2.194
e-resources = yes, #Ass = three	TAssG = V.Good	1.0	3.702
e-resources = yes, #Ass = two	TAssG = Good	1.0	3.010
e-resources = no, TQG = Fail, #Ass = one	TAssG = Fail	1.0	3.186
e-resources = no, TAssG = Fail, #Ass = one	TQG = Fail	0.72	1.529

Figure 2: Association rules for students grades

VII. CLASSIFICATION

The goal of a classifier is to learn a body of knowledge from an input dataset.The derived knowledge can then be used to predict (i.e., classify) new instances **(Giovanni Giu, 2005**).The instructor can get prediction knowledge from these rules to predict the high or low grades in the course. So he can avoid the failure of those students who are expected to fail before the final exam time. We use Decision Tree to predict the student's final grades as shown in Figure 3.Some of rules tell the instructor that some students from some specialties need special treatment or additional e-supportive materials. For example in our case study, the specialty "Islamic Education (IslamicEdu)"students who have low GPA and low MidTerm grade may fail in the final grade.

if MidTerm = V.Good and #Ass = two and GPA = V.Good then final=Excellent
if MidTerm = V.Good and #Ass = one and e-resources = yes and TQG = Good then final=Excellent
if MidTerm = Excellent and TQG = V.Good and e-resources = yes then final=Excellent
if MidTerm = Excellent and TQG = V.Good and e-resources = no and #Ass = three then final=V.Good
if MidTerm = Good and #Ass = three then final=V.Good
if MidTerm = Fail then final= Fail
if MidTerm = Pass and GPA = Pass and Department = ArabicEdu then final=V.Good
if MidTerm = Pass and GPA = Pass and Department = IslamicEdu then final =Fail
if MidTerm = Excellent and TQG = Good and #Q = five and e-resources = no and GPA = Good and #Ass = two then final=Pass

Figure 3:Classification rules for student's final grade

VIII. CLUSTERING

The idea of clustering techniques is to segment the data sets into groups of records where the similarity of the records within the cluster is maximized, and the similarity to records outside this cluster is minimized (Zhou, **2010**). We use k-Medoids method to divide the students into five groups according to their GPA and their interaction with Moodle activities. Figure 4 show that these groups have the same interaction style and grades. For example we noticed that excellent students with excellent GPA have high grades in both midterm and final. This clustering helps the instructor to give suitable contents for the poor groups to enhance their performance.

Attribute	C0	C1	C2	C3	C4
GPA	92.55	87.45	79.21	67.84	77.62
TQG	26.0	21.0	20.0	8.0	13.0
#Q	6	5	5	3	3
TAssG	5.0	8.0	5.0	6.0	6.0
#Ass	2	3	2	2	2
e-resources	1.0	1.0	0.0	0.0	1.0
MidTerm	40.0	39.0	36.0	28.0	34.0
Final	56.0	52.0	52.0	42.0	48.0

Figure 4: Clustering students into five groups

IX. CONCLUSION

Moodle is a powerful online CMS which gives instructors the ability to enhance and support the development of their students during the course studying by providing many kinds of online activities such as e-quizzes, e-assignments, e-resources and chat forums. Instructors need to examine the effectiveness of these activities on the overall performance of the students so they can take educational decisions to increase the quality of the given knowledge and information. This paper showed the success of applying Data Mining techniques as an evaluation approach by analyzing the interaction of 275 students with Moodle activities and get hidden information about this interaction. The evaluation started by collecting the required and necessary data from Moodle logs then a preprocessing is done on these data to make them ready and suitable for the data mining tasks namely: association rules, classification and clustering. In each task the results were taken and analyzed according the educational evaluation principles.Association rules help the instructor to define the relationship between the student's grades in Moodle activities and the final grade so he can examine how much the students get benefit from the supportive e-resources to get better grades. Classification is useful to predict who will get high or low final grades based on their interaction with Moodle activities. Clustering is an

effective way to divide the students into separate segments according to their behavior and performance, each segment has its own characteristics. Based on this division the instructor can design suitable guided educational contents to each segment. The knowledge from these tasks can help the decision makers in educational institutes to increase the educational quality. As a result of this work we encourage the utilization of e-learning systems to support and enhance the traditional education process and we recommend the usage of such systems when there are problems in academic achievement, also it is recommended that the best evaluation of such systems can be achieved by depending on data mining techniques so the instructors can discover new knowledge and hidden patterns which may be important in enhancement and development of education. Future research is oriented toward the construction of intelligent CMS which can be used as a powerful source of educational knowledge for instructors and decision makers in the higher levels in educational institutes. This can be achieved by integrating previous data mining tasks and new data mining techniques such as text mining and sequential pattern as well as techniques from Machine learning such as artificial neural networks and fuzzy logic in order to build effective and robust CMS

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EXAMINING ATTITUDES OF ACADEMICS TOWARDS EDUCATIONAL TECHNOLOGIES ACCORDING TO SOME DEMOGRAPHIC CHARACTERISTICS

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ABSTRACT

The aim of this research is determining the status of academics' attitudes towards educational technologies in terms of some demographic characteristics. 130 academics who work for 13 different Universities in Turkey participated to the study. There was not any significant difference of attitudes towards educational technologies' points according to gender, having an administrative position, academic title and education status. Correlation analysis revealed a negative significant correlation between age and attitudes towards educational technology. Findings were discussed according to the relevant literature and some recommendations were made.

Keywords: Educational technology, attitude, academics

INTRODUCTION

Technology rapidly develops and these Technologies are used in many places. Therefore, educational technologies are parts of education and indispensible (Kale, 2006, p.351). Namely, technology adds weight to education process (Gömleksiz & Türel, 2005, p.956). From past to present, teachers and academics in all societies teachers use various equipments in their teaching (Sarıtaş, 2007, p.55). Therefore, using educational technologies is indispensible in our day where science and technology are parts of contemporary life. (Alkan, 1998, p.47–48). Educational technology as a branch of science is an element of education process. (Tüy, 2003, p.45). Academics and teachers always try to use technology and methods related to technology to conduct their teaching mission (İşman, 2005, s.37).

It was proposed that educational materials which are related to educational programs must be used in order to increase the productivity and quality of education (Nalçacı & Ercoşkun, 2005, s.142).

There have been changes in education and teaching since people started using educational technologies for individual and institutional purposes (Odabaş, 2004). Some of these changes are giving opportunity of

accessing to the internet to the state schools, education teachers in order to enable them to use computer technologies, integration of computers with education system (Çağıltay et al., 2001) and online distance learning possibilities (Odabaş, 2004). Teachers and academics have a significant role in the success of this switch (Turan & Çolakoğlu, 2008,s107). Attitudes of teachers and academics towards educational technologies, their experiences and approaches directly affect the use of educational technologies in education.

Educators are making progress in learning about and using technology, but we have a long way to go. Educators are encouraged to practice lifelong learning by constantly enhancing their knowledge and skills (Schrum, 1999, 84).

New Technologies affect students, teachers, academics and educational environments. Technologic changes could affect the functions of teachers and this appears to be an important problem that we might face. Teachers, academics and teacher candidates who study at universities should acquire skills and information related to using educational technologies. Teachers and academics, who will educate students, should be ready to use all new technologies. Educational technology could be called a culture that should be adopted by everybody in education environment (Leh, 1998' as cited in, Tor and Erden, 2004, 123).

Decisions made by teachers about the use of computers in their classrooms are likely to be influenced by multiple factors including the accessibility of hardware and relevant software, the nature of the curriculum, personal capabilities and constraints such as time. However, there is substantial evidence to suggest that, teachers' beliefs in their capacity to work effectively with technology are a significant factor in determining patterns of classroom computer use (O'Dwyer et al., 2004, 1)

Over the past decade, investment in technology for schools has increased at a dramatic rate. Although policy makers are eager to understand the ways in which technology use in schools is affecting student learning, we believe that a critical preliminary step toward assessing the impacts of technology on teaching and learning requires the examination of the varied uses of technology in schools as well as the contexts that are likely to affect the use of technology in the classroom as a teaching and learning tool (O'Dwyer et al., 2004, 1.).

Although the work by Becker et al. found "technology use" to be a multi-faceted phenomenon, the majority of their research focused on teachers' use of technology to deliver instruction (Becker et al as cited in O'Dwyer et al., 2004, 2).

Physical education and sport science is a multidisciplinary field of science and interact with various areas of science. There are four different departments in schools of physical education and sports which are physical education and sport teaching, sports coaching, recreation and sport management. As it is understood from the names of the departments, there are various classes related to social, health and applied sciences. A significant amount of classes in these schools includes theory and the rest of the classes are practical. These practical classes such as football, basketball and handball include teaching methods which were consecutively applied. Therefore, lectures in schools of physical education and sports are conducted in a range of places such as laboratories, classes, athletics tracks, sport halls. That is why educational technologies could be used in

physical education and sport classes in order to analyse fundamental techniques in sport with the aim of using them in forming their teaching methods, to teach theoretical lectures such as sports psychology, physiology, anatomy, sports philosophy, sports coaching, sport management, sport sponsorship, sport economy, sport marketing etc. It could be said that up to date educational technologies could be used in the context of physical education and sport to enhance the quality of learning and teaching.

The aim of this research is determining the status of academics' attitudes towards educational technologies in terms of different demographic characteristics.

METHOD

Participants: Participants were 130 academics who work for 13 different Universities in Turkey. Mean age was 38,79 (sd=7,06) and mean job experience was 13,72 (sd=7,25).

Data collection tool: Attitudes towards Educational technology Scale which was developed by Pala (2006) was used for the current study.Validity and reliability study of the scale was made by Pala (2006) and it is a 5-point likert scale consisting of 43 items. Answers ranged from "complately agree" to "complately dissagree." The was also used by Özgen and Obay (2008).

Data collection: Questionnaires were collected from academics in face to face interactions in their universities. The study was based on voluntary participation and the participants were informed that obtained data would be anonymous.

Data analysis: SPSS 17 package program was used for data analysis and level of significance was determined to be 0,05.

RESULTS

Table 1. Demographic Characteristics of Participants

Title	N	%
Professor	3	2,3
Associate Prof..	6	4,6
Asst.Prof.	66	50,8
Senior Lecturer	27	20,8
Lecturer	20	15,4
Research Assistant	8	6,2
Gender		
Male	106	81,5

Female	24	18,5
Marital Status		
Married	111	85,4
Single	19	14,6
Educational Status		
Undergraduate	3	2,3
Master	47	36,2
PhD	80	61,5
Administrative Position		
Yes	30	23,1
No	100	76,9

Table 2. Educational technology points according to gender

	Gender	N	Mean	Std. Deviation	p
Attitudes Towards Educational Technology	Male	106	4,0621	,56629	0,96
	Female	24	3,9439	,51185	

t-test showed that there was not any significant difference between male and female according to attitudes towards educational technology (p>0,05)

Table 3. Educational technology points according to having an administrative position

	Administrative Position	N	Mean	Std. Deviation	p
Attitudes Towards Educational Technology	Yes	29	4,0343	,41851	0,33
	No	99	4,0369	,59626	

Attitudes towards educational technology points according to having an administrative position showed that there was not any significant difference (p>0,05)

Table 4. Educational technology points according to their title

Title	Mean	N	Std. Deviation	F	p
Professor	4,2596	3	,00770	1,555	0,17
Associate Prof..	4,1635	6	,24342		
Asst.Prof.	3,9157	66	,64905		
Senior Lecturer	4,1437	27	,47173		
Lecturer	4,1270	20	,39875		
Research Assistant	4,3272	8	,40131		

Title	Mean	N	Std. Deviation	F	p
Professor	4,2596	3	,00770		
Associate Prof..	4,1635	6	,24342		
Asst.Prof.	3,9157	66	,64905	1,555	0,17
Senior Lecturer	4,1437	27	,47173		
Lecturer	4,1270	20	,39875		
Research Assistant	4,3272	8	,40131		
Total	4,0402	130	,55664		

Attitudes towards educational technology points according to titles showed that there was not any significant difference among participants (p>0,05)

Table 5. Educational technology points according to education status

Education	Mean	N	Std. Deviation	F	p
Undergraduate	4,5736	3	,25617		
Master	4,1131	47	,42481	2,337	0,10
PhD	3,9774	80	,61746		
Total	4,0402	130	,55664		

Attitudes towards educational technology points according to participants' educational status revealed that there was not any significant difference among educational groups.

Table 6. correlation among age, experience, educational technology points

		Age	Job Experience	Attitudes Towards Educational Technology
Age	r	1		
	p			
Job Experience	r	,908**	1	
	p	,000		
Attitudes Towards Educational Technology	r	-,185*	-,146	1
	p	,037	,101	

Pearson's correlation analysis showed that there was a negative significant correlation between age and attitudes towards educational technology.

DISCUSSION

Despite some limitations in the scope of the research-based evidence, there does seem to be a sufficient body of data, both quantitative and qualitative, to determine a positive relationship between increased use of educational technologies and student achievement (Schacter, 2005; Akçay, 2003).

Moreover, Kabadayı's study (2006) data showed that 'teachers are not motivated enough to overcome the difficulties in manipulating technological devices in classroom settings. Both pre-service and their cooperating teachers do not perceive using technology in class as waste of time since they believe that using technology facilitates the students' success and their learning."

In addition Miller (1999) reported in their study that "Most teachers reported improved test scores, better behavior among students actively engaged with technology, and increased self-esteem and self-confidence among many students involved with the educational technology program"

t-test analysis showed that there was not any significant difference of attitudes towards educational technology points in terms of gender, having an administrative position, title, educational groups. This case shows that attitudes towards of academics towards educational technologies are not affected by gender, administrative position, title and education status. In other words, all academics in this research have similar positive attitudes towards educational technologies.

Moreover, correlation analysis showed a strong significant correlation between age and educational technology points; a significant negative correlation between job experience and attitudes towards educational technology.

The positive correlation between age and attitudes towards educational technologies might result from the fact that new technologies are not familiar to academics or they do not know how to use them.

The reasons of the negative significant correlation between job experience and attitudes towards educational technologies might be similar to the reasons of the relationship between age and attitudes towards educational Technologies. Because, people who have more job experience are generally the ones who are older. Therefore, people who have more job experience are incapable of knowing, following and using educational technologies compared to the new generation of academics. It could be said that this case affects their attitudes towards educational technologies.

Implications for further research

Some suggestions for further studies could be made from the results of this study: 1- Academics can be informed by various courses about the new educational technologies and about accessing and using them. Because, for example Hua and Peggy stated that taking an introductory educational technology course was found to be helpful in improving preservice teachers' technology attitudes related to educational benefits. 2- Students should also be encouraged to use educational technologies in their class's activities. 3- Facilities of educational technologies in the universities should be improved. 4- Future research could focus on a) whether educational technologies adequately meet the educational needs of academics, b) facilities of academics to access educational technologies, c) whether academics could effectively use educational technologies.

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EXPLORING RECIPROCITY OF INFORMATION EXCHANGE IN ONLINE DISCOURSE OF STUDENT GROUPS

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ABSTRACT: In e-learning, studies have examined the quality of electronic educational discourse for the presence of information sharing with content analytical methods. The method of social network analysis (SNA) has recently been applied to the discourse of computer-mediated communication (CMC) supported learning groups. While research has mainly focused on network analysis of asynchronous CMC interaction, this study examined information exchange in the synchronous CMC of two e-learning groups in terms of SNA measures of actor-node types and group reciprocity. Also, survey perception analysis was used to examine student perceptions on the relevance of discussions. The survey findings showed that discussions were relevant to the learning tasks. SNA results from comparative group analysis elaborated on the survey findings and revealed differences in reciprocity at group level and mutuality in information sharing at actor level. These findings have implications for e-tutor facilitation of collaborative learning processes and the design of online activities.

Keywords: collaborative learning, synchronous computer-mediated communication, social network analysis

1. INTRODUCTION

Sociocultural constructivism (Vygotsky, 1962) regards interaction as vital to collaborative learning processes as it facilitates the sharing of individual interpretations of experiences and negotiation of meaning that leads to joint knowledge construction. In e-learning, online interaction also helps to reduce transactional distance between distant learners that could result in greater student satisfaction with the learning experience. Studies have examined the quality of electronic educational discourse, from a constructivist framework, for indications of information sharing and negotiation of understandings with discourse and content analytical methods (Garrison, 2003). Recently, the method of social network analysis (SNA) has been applied to examining the discourse of computer-mediated communication (CMC) supported learning groups. In Aviv and Ravid (2005), asynchronous discussion postings were analyzed using a combination of SNA and content analysis methods to investigate participation patterns, learner network structures, and quality of the knowledge construction process.

While research has mainly focused on the network analysis of asynchronous CMC interaction, this study examines patterns of information exchange present in the online synchronous (chat) tutorial discussions of two virtual learning groups in an undergraduate distance course. This paper presents quantitative SNA results from comparative group analysis on reciprocity and mutuality in information sharing among participants in the two learning groups. Survey findings are also presented on student perceptions on the relevance of tutorial discussions to the learning tasks.

1.1 Characteristics of Computer-Mediated Interaction

Computer-mediated communication technologies offer various capabilities and constraints for supporting educational interactions. The asynchronous CMC mode enables delayed-time dialog, through applications such as email and discussion forums, mainly in the form of text-based contributions that can be composed, sent, accessed, without time or proximity constraints. This study focuses on the synchronous CMC mode that requires communicating parties to be 'present' at the same time to engage in dialog. Chat interactions are largely text-based messages, composed and sent by parties who are simultaneously logged in chat rooms. Chat messages appear chronologically and scroll up screens at a speed corresponding to the conversational pace, which brings a sense of temporal immediacy to the interaction.

Even as distance education has embraced CMC for increasing interaction and reducing transactional distance, there are divergent positions held by researchers on the effects of CMC on communicative behavior. From the cues-filtered out theoretical perspective (Culnan & Markus, 1987), solely text-based interactions (including chat) are assumed to have low social presence, provide fewer

interactional cues than face-to-face encounters, and result in negative interpersonal perceptions that disrupt collaborative learning. However, other studies have taken the stand that the appearance screening capability of text-based CMC, which filters out social context cues (Kiesler et al., 1984), could encourage greater self-disclosure that builds ties in e-learning groups and lead to greater equality of participation (Siegel et al., 1986). Moreover, the social information processing model (Fulk et al., 1990) claims that the need for affinity drives people to establish social ties using whatever information and communication means available. Hence, learners develop adaptive strategies and change their linguistic and/or interactional behavior to facilitate information sharing and overcome the limitations of the online communication mode.

1.2 Computer-Mediated Discourse

Computer-mediated discourse (CMD) refers to the electronic communication produced by humans via networked computers (Herring, 2003). The type of CMD of relevance here is synchronous CMD (chat discourse) that is structurally distinctive from text and talk for its interweaving text-based conversational threads containing different topics and speech acts. Lapadat (2002) characterized it as brief, rapid messages with overlapping multiple topics in chronological not topical sequence. Other features unique to chat discourse include the presence of explicit addressing, paralinguistic communication conventions (emoticons, emotags, acronyms), server messages, informality of language structure, and a lack of punctuation and capitalization.

From a pedagogical perspective, such characterization leaves chat discourse vulnerable to claims of interactional incoherence (Herring, 1999), with the implication that the synchronous CMC medium is incapable of supporting collaboration and learning. For instance, Lapadat (2002) asserted that compared to the fragmented threads in chat discourse, student postings in course discussion forums are dense with meaning, coherent, and complete because the asynchronous CMC media support prolonged periods of discussion and facilitate reflection by learners. Furthermore, the lack of conventional turn-taking cues may result in multiple overlapping messages or isolated postings resulting in a loss of discussion focus.

However, it can be argued that these features of chat discourse comprise the appeal of the synchronous CMC mode; to be exploited in instructional activities that require fast decision-making, development of argumentation skills or creative language play. Nevertheless, given the sociocultural constructivist view that knowledge is constituted in the dialogic exchanges, the presence of such features in educational chat discourse could undermine collaborative efforts in information sharing and disrupt the learning process. The research case described next presented an opportunity to further current understanding on the impact of synchronous CMC mode on information exchange during the collaborative learning processes of virtual learning groups.

2. THE RESEARCH CONTEXT

The participants in this case study were undergraduates in a distance IT course belonging to two (out of four) tutorial groups (Group 1 n=15; Group 4 n=9), two tutors and the author. Both tutorial groups were involved in equivalent learning activities. The course adopted a blended delivery design; with face-to-face lectures and formal tutorials held in WebCT chat rooms.

The weekly chat tutorials are seminars for reviewing the course literature, with a tutor-facilitator and student presenters moderating the discussion of set readings. The presenter role is rotated among all students in each group. More specifically, a presenter moderates a ½ hour discussion slot (an episode) in the one-hour tutorial session based on his/her critiques of the week's readings. The tutor acts as a facilitator, evaluates the presenter's performance and quality of participation by other students. The other students participate in discussions and reflectively evaluate the presenter with the aid of archived discussion logs. The course constructivist pedagogical framework is reflected in the chat tutorial activity that involves critical review of readings, dialogic exchange of perspectives, and reflection on learning.

3. THE METHODS

3.1 Social Network Analysis

Social network analysis is a method enabling the patterning of relations among social actors at different levels of analysis such as persons and groups. Essentially, SNA assumes the primacy of relational ties between social units and that interactions between actors sustain and define groups. SNA

techniques include quantitative statistical analysis to analyze and model relational data. In this study, network analysis is applied to textual data comprising conversational turns/ties by actors/nodes engaged in online exchanges (Table 1). A tie represents a connection/link between two actors/nodes and ties are means for the exchange of information, social and emotional support between learners. Ties also reflect the learners' interactions as initiating/responding in exchanges that are characterized by the transfer (one-way) or exchange (two-way) of nonmaterial resources (information).

Given the conversational characteristics of chat discourse and the constructivist view that sharing of individual understandings enables meaning negotiation in knowledge building processes, SNA could be considered a particularly appropriate method for furthering understanding of the dynamic to-and-fro pattern of information exchange in the dialogue of online learning groups. This study applied the SNA measures of actor-node types and group reciprocity (explained below) to examine patterns of information flow present in the chat exchanges of two virtual learning groups.

Table 1: Example of a chat exchange

Participant A	Is there a difference between a group of people and a team?
Participant B	what is your definition of "group"?
Participant C	I think team members have roles, are accountable the team, but a group is just a collective
Participant D	i agree.. a team has roles to and work towards completing a task
Participant A	I concur

3.2 SNA Measures

A node represents a social unit which could be an individual (actor), group or an abstraction. In this study, actor-nodes are a finite set of participants in the two learning groups (G1,G4) who are distributors and/or recipients of information during tutorial discussions held in chat rooms. Based on their overall tendencies to send and/or receive ties or turns in chat exchanges, actors could be categorized as four node types: *Isolate; Transmitter; Receiver; Carrier* (Wasserman & Faust, 1994) (Figure 1). Hence, the proportion of actor-node types present could indicate the extent of directional symmetry or mutuality in information sharing during collaborative learning processes.

Reciprocity is defined as a state whereby both actors in a dyad choose the other on a relation. A relation is the type of tie such as information exchange. In such a relation, ties are directed and valued indicating respectively, the communicative direction of information exchange (ties sent or received), and the frequency of the interaction as degree of connection between a node to other nodes (Figure 2). Reciprocation of choice at the group level could be measured with a reciprocity index that indicates the strength of tendency of the group towards mutual exchange of information.

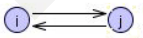
	(i) = Isolate: actor-node with no ties incident to or from it.
	(i) = Transmitter: actor-node with only ties originating from it.
	(i) = Receiver: actor-node with only ties terminating at it.
	(i) = Carrier: actor-node with ties incident to and from it.

Fig 1: Actor-node types (adapted from Lim, 2006, p.134)

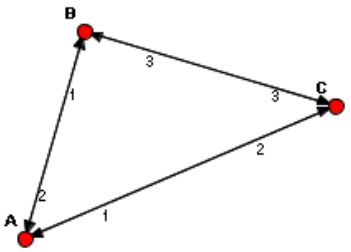


Fig 2: Ties in a relation: directed and valued

3.3 Transcript Dataset and SNA Software

The dataset comprised transcripts of archived chat discussion logs collected over 11 weeks for both groups. In total, the complete dataset comprised 22 sessions (one-hour tutorial) or 44 episodes (½ hour discussion slot) i.e., 11 sessions for each group with two episodes in each session. The chat transcripts were initially analyzed using a discourse analysis coding scheme to form chat exchanges described further in Lim & Sudweeks (2008). Then network analysis was carried out with NetMiner II (Cyram, 2004); a commercial SNA program that supports network analysis and data visualization.

3.4 Survey Instrument and Dataset

A web survey comprising closed and open-ended questions was administered to 23 student respondents with return rates of 93% (G1) and 89% (G4). Responses to closed questions were pre-coded by the survey software prior to descriptive statistical analysis. This paper presents results on student views on the importance of the relevance of tutorial discussions and satisfaction with their experiences with factor during online tutorials: *(Q.8b/9b) From your experience of online tutorials in this unit, how important/how satisfied are you with the given factor: Discussions are relevant to the course readings?*

4. THE RESULTS

4.1 SNA Results: Symmetry of Information Exchange (Actor-Nodes)

In actor-nodes type analysis, participants were only categorized as Receiver and Carrier at episode level for two reasons: (a) The nature of the learning activity during which presenters are required to post summaries of set-readings at the start of each episode that are interpreted as being addressed to all participants in the group. Hence, the default node type would be Receiver since all actor-nodes would have at least one tie incident to it; (b) There would be no Transmitters since any default Receiver node that sends a tie would be categorized as a Carrier which has ties incident to and from it. Table 3 summarizes the predominant node types adopted by G1 and G4 actors for all episodes: G1 actors were Receivers in 15.5% of all episodes compared to 4.1% in G4. G1 actors were Carriers in 84.5% of all episodes compared to 95.1% in G4.

Table 3: Actor-node types (G1 & G4, all episodes)

	G1		G4	
	Receiver	Carrier	Receiver	Carrier
Total	43	234	8	188
%	**15.5**	**84.5**	**4.1**	**95.9**

4.2 SNA Results: Symmetry of Information Exchange (Group Reciprocity)

Group reciprocity was calculated with a reciprocity index that indicates the strength of tendency of the group towards reciprocation of choice at the episode level. In directed relationships, reciprocity is present when both actors in a dyad choose the other on a relation i.e. exchange of information. The reciprocity index used the formula: ratio of the maximum number of reciprocated ties to total number of ties. Application of the reciprocity index assumes the following data conditions: (a) presence of directed ties; (b) conversion of valued ties to dichotomous ties.

The value obtained with the reciprocity index could range from 0 to 1; indicating the likelihood of a sent tie to receive a tie in return, within an episode. If the value = 0, then there is no tendency to reciprocate; if the value = 1, the tendency is maximal i.e., all ties are reciprocated. It was found that G1 reciprocity values ranged from 0.93 (S5-E1) to 0.40 (S9-E2). G4 reciprocity values ranged from 1.00 (S7-E1) to 0.60 (S10-E1).

4.3 Survey Results: Relevance of Discussion

In the survey, student respondents indicated the levels of importance of the factor - relevance of tutorial discussions to the unit (course) readings - and satisfaction with their experiences with factor during online tutorials (Q.8b/9b) on a 4-point scale from *Very Important/Very Satisfied* to Not

Important/Not Satisfied. Table 4 shows that most G1 respondents (92.3%) regarded the factor as important and were equally satisfied with their experiences. In G4, the factor was regarded as important by all respondents and 87.5% were satisfied with their experiences.

Table 4: Satisfaction with relevance of discussion

	Scale	VI&I*	SI&NI*
Group 1	Importance (Q.8b)	92.3% (12)	7.7% (1)
		VS&S**	**SS&NS****
	Satisfaction (Q.9b)	92.3% (12)	7.7% (1)
Group 4		**VI&I***	**SI&NI***
	Importance (Q.8b)	100.0% (8)	0.0% (0)
		VS&S**	**SS&NS****
	Satisfaction (Q.9b)	87.5% (7)	12.5% (1)

5. DISCUSSION AND CONCLUSION

As sociocultural constructivism regards the sharing of individual knowledge as an essential aspect of the collaborative learning process, this study aims to gain insight into patterns of information flow in the chat exchanges of two virtual learning groups with the method of social network analysis. For method triangulation, a web survey was conducted on student experiences of chat tutorials that included a question on their perceptions of the relevance of tutorial discussions to the course topics.

The web survey findings showed very minor differences between groups as most respondents (from both groups) considered the relevance of discussions as an important factor and were satisfied with their experiences of the factor during chat tutorials. The findings may be attributed to the structured design of the tutorial activity whereby the discussions were moderated and definite roles were assigned to the students. While the web survey revealed a broad yet personal dimension of the collaborative learning process, the SNA findings provided a finer-grained impression of the dynamic to-and-fro exchange of information during the online tutorial discussions from the transcript data.

Results from the SNA measure of actor-node type suggest that G1 actors were more likely to only receive ties, hence displaying an asymmetrical directional flow of information compared to G4 actors. In contrast, G4 actors were more likely to both send and receive ties, thus displaying greater mutuality in sharing information than G1 actors. Group reciprocity analysis showed that G4 reciprocity levels were generally higher than G1 for most episodes indicating a greater tendency towards reciprocation of ties. When considered together with findings from actor-node type analysis, group reciprocity analysis confirmed the impression that compared to G1, mutuality in information exchange was more evident in G4. Hence, G4 may be a more inclusive and balanced group in terms of information exchange during the collaborative learning process. This may be partly explained by the profile of G1 participants. The web survey included several demographic questions and a question covered participants' experience with chat use prior to the course. The survey results showed that while all G4 participants had used chat before enrolment in this course, fewer G1 participants had experience in the use of chat technology.

At this point, it is necessary to acknowledge certain limitations in the data and design of this study. Firstly, it is acknowledged that the transcript data used for network analysis did not reflect all the details surrounding the events in the tutorials and that the findings from SNA alone present a limited account of the analyst's interpretation of what occurred during the discussions. However, this study took into account these limitations by integrating social network and survey perception analytical methods and the triangulation of different perspectives on the chat interaction enhances the validity of this qualitative study. In the future, this study could be extended by further triangulating tutors' perspective of the quality of learning interaction with the students' perceptions and the evidence from discourse analysis of the discussion transcripts. Secondly, knowledge from network analysis and participant self-reports from this study are not claimed to be generalizable to wider populations. However, the implications for e-tutor facilitation of collaborative learning processes and the design of online activities supported by synchronous CMC technologies drawn from the findings may be extrapolated to similar contexts.

The findings on group differences in extent of collaborative effort in information exchange and satisfaction with the relevance of tutorial discussions suggest that not all learners may be comfortable with the use of synchronous CMC technology. This was consistent with the group demographic profile which showed that G1 participants had comparatively less experience than G4 participants in the use of

chat. Therefore, it is recommended that blended e-course designs that offer various means of interaction (such as face-to-face, asynchronous and/or synchronous CMC) could enable learners, who are not comfortable with a specific communication channel, to have recourse to other means of communication for sharing individual understandings.

Moreover, findings from network analysis suggest the need for improvement in managing participation in collaborative group learning. In order to reduce passivity and increase involvement in learning discussions, it is recommended that e-tutors should conduct review sessions in the early part of each semester. In such sessions, the e-tutors could specifically focus on successful strategies used by student presenters to stimulate discussion and include others in the exchanges by using excerpts from the archived discussion logs.

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EXPLORING THE DIFFERENT ASPECTS OF THE INTERNET LEISURE USE BY COLLEGE STUDENTS IN TAIWAN

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ABSTRACT

The findings demonstrated that college students tend to recognize use perception, flow experience, and continuance intentions in leisure Internet usage positively. Browsers and instant messenger are the most commonly used applications. Male and female users' continuance intentions of leisure Internet usage are significantly different. Ease of use has significant difference on online games and FTP (File Transfer Protocol) use; use of online games and BBS (Bulletin Board System) has significant difference on continuance intention; use perception and flow experience have significant correlations with college students' continuance intentions of leisure Internet usage.

Keywords: Internet; leisure; flow experience; use perception; continuance intention

INTRODUCTION

As Internet usage prevails, many recent studies have been conducted on Internet use (Brenner, 1997; Young, 1998; Kandell, 1998). At present, Internet users among college students in Taiwan have achieved 100% (Taiwan Network Information Center, 2010). Therefore, this study aimed to treat college students as subjects, and attempted to determine their flow experiences in leisure Internet usage.

The purpose of study was to probe into the correlations between flow experience and continuance

intentions of Internet leisure activities, and recognize college students' use characteristics and behaviors in Internet leisure through a questionnaire survey. The subjects' software selections in Internet leisure activities, gender difference in Internet usage behavior, cognition of Internet leisure, flow experience, and continuance intentions of internal leisure were discussed. Based on the above, hypotheses of this study are proposed as follows:

H1: There is a significant correlation between use perceptions and flow experiences of Internet leisure.

H2: There is a significant correlation between use perceptions and continuance intentions of Internet leisure.

H3: There is a significant correlation between flow experiences and continuance intentions of Internet leisure.

LITERATURE REVIEW

The Flow Theory was proposed by psychologist Csikszentmihalyi (1975), and was originally defined as "when participating in certain activities, the participants are attracted and concentrated, ignore the unrelated perceptions and affairs, lose self-consciousness, and only respond to specific goals and feedback, and have a sense of control of environment; such state is known as the flow experience". Csikszentmihalyi (1975) indicated that during the interaction between individuals and the content of the activities, the perceived balance between their activity capacity, skills, and the challenge in the activities, are likely to result in flow experience. Csikszentmihalyi (1975) also suggested that once individuals have flow experience, they would be willing to rejoin the same activity (Csikszentmihalyi & LeFevre, 1989).

The flow state of a Model of Network Navigation in a Hypermedia (CME) is based on a balance of skills and challenges (high or low degrees) (Novak & Hoffman, 1997). Flow is a kind of temporary and subjective experience or state, and differs according to individual experiences. Perceived challenges and skills are not definite abilities, and vary according to individual perceptions.

In Internet leisure activities, the participants' flow experience would result in positive feelings and satisfaction. Webster et al. (1993) studied the usage of computer software, such as e-mail, and found a perception correlation between flow experience and users. Users would be willing to use and explore the software, and easily attain flow experience (Webster, Trevino & Ryan, 1993; Trevino & Webster, 1992).

METHODS

The hypotheses were validated according to the research framework (Figure 1) and literature reviews.

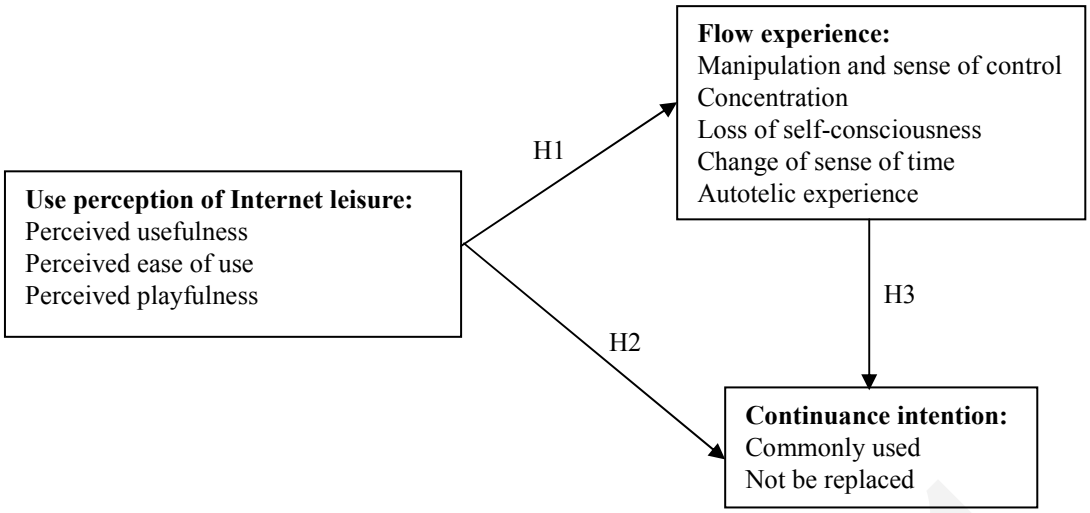

Figure 1. Research Framework

This study investigated college students to determine if they have continuance intentions upon the use perceptions of the Internet through leisure activities with related software or behaviors, and if they have flow experience. Questionnaire survey and analysis were conducted only on college students in Taiwan. A total of 500 questionnaires were distributed, and the valid return rate was 93.2% (198 males and 268 females). Statistical tests, analysis, and explanations were conducted on questionnaire results. In order to probe into the correlations among use perception, flow experience, and continuance intention in hypotheses, Canonical Correlation Analysis was conducted.

RESULTS AND DISCUSSIONS

Leisure Internet Usage

The means of leisure Internet usage are as follows, perceived usefulness (M= 5.51), perceived ease of use (M= 5.39), perceived playfulness (M= 4.91); the overall mean of use perception (M= 5.27) was above the median points of a 7-point scale (4). This indicated that, regarding leisure Internet usage, college students positively identify with "use perception"; means of continuance intention (M= 5.51) were above the median point of a 7-point scale (4), and flow experience (M= 3.41) was also above the median point of a 5-point scale (3). This indicated that college students positively identify with "flow experience" and "continuance intentions". This indicated that browsers and instant messenger are the most commonly used by online users and popular behavior or software selection.

Analysis of Gender Differences

As to "Perceived Usefulness" of leisure Internet usage, both male and female students suggested that it is useful, and did not reveal significant use differences (t= -0.70, p>.05). Regarding "perceived ease of use", both male and female students suggested that Internet behavior or software use is easy, and did not reveal significant use differences (t= -0.15, p>.05). Regarding "perceived playfulness", both male and female students indicated that Internet behavior or software use is playful, and did not reveal significant use differences (t= -0.63, p>.05).

According to the findings of male and female students' flow experience after related Internet behavior or software use, the participants all suggested recognition of flow experience. Hence, gender did not reveal significant use differences (t= -0.37, p>.05**)**. Then, t-test was conducted on the influences of certain Internet behaviors and software use on flow experience, and found that they do not have significant differences on degrees of flow experiences. Both male and female student users showed significant different continuance intentions in leisure Internet usage (t= -3.13*, p <.01), while males had higher continuance intentions.

Correlation Analysis of Use Perceptions and Flow Experiences

Canonical Correlation Analysis on "use perception" and "flow experience" is shown in Table 1. There is a significant correlation between college students' "use perception" and "flow experience" in Internet leisure, indicating that positive "use perception" in Internet leisure would result in positive "flow experience". Canonical Cross Coefficients showed that except for "loss of self-consciousness", which had lower correlation coefficient, all other factors revealed significant correlation coefficients. Therefore, the findings validate H1.

Table 1. Canonical Correlation and Cross Structure Analysis of Use Perception and Flow Experience

Canon	Canonical Correlation Coefficient (ρ)	Square of Canonical Correlation Coefficient (ρ2)	Significance test (Wilk's λ)	Significance (p)
1	.637	.406	.488	.000
2	.372	.138	.822	.000
3	.214	.046	.954	.000
*** p<.001				

Variables	Cross loading		
	Canon 1	Canon 2	Canon 3
Control variables:			
Perceived usefulness	-.753	-.529	.392
Perceived ease of use	-.775	.579	.252
Perceived playfulness	-.805	-.180	-.566
Criterion variable:			
Manipulation and control	-.844	.509	-.032
Concentration	-.751	.002	-.316
Loss of self-consciousness	-.293	-.019	-.281
Change of sense of time	-.868	-.393	.276
Autotelic experience	-.644	-.301	-.626

Correlation Analysis of Use Perception and Continuance Intentions

Canonical Correlation analysis on "use perception" and "continuance intentions" is shown in Table

2. There is a significant correlation between college students' "use perception" and "continuance intentions", indicating that in Internet leisure, positive "use perception" would result in positive "continuance intentions". Therefore, H2 is validated.

Table 2. Canonical Correlation and Cross Structure Analysis of Use Perception and Continuance Intentions

Canon	Canonical Correlation Coefficient (ρ)	Square of Canonical Correlation Coefficient (ρ2)	Significance test (Wilk's λ)	Significance (*p*)
1	0.613	0.376	0.623	0.000
*** $p<.001$				
Variables		Cross loading		
Control variables:				
Perceived Usefulness		0.930		
Perceived ease of use		0.572		
Perceived playfulness		0.733		
Criterion variable:				
Commonly used		0.964		
Not be replaced		0.899		

Correlation Analysis of Flow Experience and Continuance Intentions

Canonical Correlation Analysis of "flow experience" and "continuance intention" is shown in Table 3. According to correlation analysis on flow experience and continuance intention, there is a significant correlation between college students' "flow experience" and "continuance intentions" in Internet leisure. This indicated more positive "flow experience" would result in positive "continuance intention". The cross correlation coefficient of low loss of self-consciousness indicated that reactions to external attitudes are not the main attribute of continuance intention. Therefore, H3 is validated.

Table 3. Canonical Correlation and Cross Structure Analysis of Flow Experience and Continuance Intention

Canon	Canonical Correlation Coefficient (ρ)	Square of Canonical Correlation Coefficient (ρ2)	Significance test (Wilk's λ)	Significance (*p*)
1	0.547	0.299	0.696	0.000
*** $p<.001$				
Variables		Cross loading		
Control variables:				
Manipulation and control		0.673		
Concentration		0.750		
Loss of self-consciousness		0.191		

Change of sense of time	0.911
Autotelic experience	0.704
Criterion variable:	
Commonly used	0.909
Not be replaced	0.958

CONCLUSIONS

According to the statistical analysis of this study, the conclusions are summarized. Browsers and instant messenger are the most popular software for college students in terms of leisure activities. This study found that college students positively identify with use perceptions, flow experiences, and continuance intentions of leisure Internet usage. In conclusion, when college students engage in leisure activities through Internet tools, their perceptions of use or flow experiences can lead to recreational essence, and enhance continuance intentions.

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THE INFLUENCE OF MULTIMEDIA DISPLAY METHODS ON THE LEARNING ACCOMPLISHIMENTS OF ELEMENTARY SCHOOL STUDENTS: THE ISSUE OF ENVIRONMENTAL PROTECTUIB AS AN EXAMPLE

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Abstract

This study was aimed to examine the influence of multimedia presentation modes (e.g. static graphs plus speech and text, static graphs plus speech, and static graphs plus text) and attention types (e.g. excellent and general) on learning performance among elementary school students as well as to explore their the reciprocal effects. This study used quasi-experimental design using three learning materials related to environmental protection issue. A total of 63 3rd grade students from three schools in Pingtung County, Taiwan participated in the study. Pre- and post-tests were implemented in the study. Collected data were analyzed by Two-way ANCOVA, One-way ANCOVA, and One-way ANOVA. The findings of the study are (1) the interaction of different multimedia presentation modes and students' attention has no significant effect on learning performance; (2) different multimedia presentation modes have significantly impacts on learning performance of environmental protection. The posttest score in static graphs plus speech and text group is better than the score in static graphs plus speech group; (3) the different multimedia presentation modes have significantly impacts on learning performance of environmental protection. The posttest score in static graphs plus speech and text group is better than the score in static graphs plus speech group; and (4) different attentions of the students show no significant impact on learning performance of environmental protection.

Keywords: multimedia presentation modes, attention, environmental protection issue

Introduction

In the 21st Century, information can be transmitted to every corner of the world and combined with daily life through the world of the internet. Office of Technology Assessment (OTA) of the United States has pointed out that computer technology has caused important changes to instruction and learning (OTA, 1995); many empirical studies have discovered that incorporating technology into the learning environment can provide students with more opportunities for learning and promote student ability in exploring concepts and organizing knowledge. Teachers are key persons who guide students in learning

the abilities and attitudes relating to the application of information technology. Teachers not only need to possess professional knowledge of their subjects and professional know-how for instruction, but also need to have the ability to apply information technology to elevate student learning accomplishments (Ministry of Education, 2008). Mayer's modality principle states that if learners look at text and image at the same time, it would overload the visual channels, while simultaneous appearance of text and narration would cause redundancy; a simultaneous display of images and narration would decrease the burden on visual channels (Mayer, 2001; Mayer & Rigotti, 2007). Thus, teachers need to integrate multimedia and consider how to incorporate presentation into instruction to concentrate the attention of students, elevate learning interest, and achieve better learning accomplishments.

In 1972, the "Declaration of the United Nations Conference on the Human Environment" announced the conceptual connection between humans and the environment, arriving at the worldwide consensus on the issue of environmental protection that "we only have one Earth" and "people and the environment are an indivisible common entity. On February 16, 2005, the Kyoto Protocol took effect, and controlling the emission of greenhouse gases became an important environmental protection issue for many countries. The report by the Intergovernmental Panel on Climate Change (IPCC) in 2007 stated that due to the greenhouse gases being emitted by human activity, the global temperature has continued to increase, leader to worsening environmental problems such as wind disasters, landslides, and droughts. In the United Nations' Agenda 21 for Sustainable Development, Article 36 states that education is the key to promoting sustainable development and resolution of environmental problems. In 1992, the Executive Yuan clarified that environmental education is a lifelong education including family, school, and social education; it needs to begin from preschool education, so that cherishing good fortune, loving things, and reducing waste can be part of daily life. In 2008 the Environmental Protection Administration of R.O.C. established "save energy and reduce carbon to love Earth," "recycle resources for zero waste," "do not pollute, conserve and protect ecology," and "clean homes and live in Lohas" as the administrative focuses of the Environmental Protection Administration, the objective for sustainable national development. The protection of the Earth's environment and carrying out recycling in daily life would be the important work of saving energy and reducing carbon (Environmental Protection Administration, 2011).

Environmental education is an important point in school education, and it is necessary to incorporate environmental education into academic subjects in elementary school. This study uses environmental protection issues in caring for Planet Earth most commonly known by elementary school students in daily life, such as recycling, reducing Garbage, and saving water resources. The Modality Principle and Redundancy Principle are used to verify how well images with sound and text (Group with Pictures, Sounds, and Texts), images with sound (Group with Pictures and Sounds), and images with text (Group with Pictures and Texts) affect the learning accomplishments of content memory, learning comprehension, and learning transfer in learning environmental protection issues and concentration (good concentration ability, normal concentration ability) of elementary school students in short periods of time.

Methodology

This study uses quasi-experimental design method, to randomly sample three classes in the third grade in two elementary schools that have largely similar computer equipment and environment in Pingtung County in 2009. Each class has 21 students with normal vision and hearing for a total of 63 students, who are then divided into groups A, B, and C.

Experiment design

Table 1: Experiment design model

Class	Pre-test	First week	Second week	Third week
Class A	O_1	X_{12} P_1	X_{21} P_2	X_{33} P_3
Class B	O_1	X_{11} P_1	X_{23} P_2	X_{32} P_3
Class C	O_1	X_{13} P_1	X_{22} P_2	X_{31} P_3

The meaning of various symbols in Table 1:

(1) O_1 means that each class underwent the same pre-test before the experiment.

(2) X_{11}, X_{12}, X_{13} refers to the three experiment processes in Instructional Material 1, which are X_{11}, which means that Instructional Material 1is Group with Pictures, Sounds, and Texts, X_{12} means the Instructional Material 1with Group with Pictures and Sounds, X_{13} means the Instructional Material 1 with Group with Pictures and Texts; the sequences differed based on the classes. For each class, Instructional Material 2 and Instructional Material 3 are used every second week.

(3) P_1, P_2, P_3 means that after the experiments of the three types of Instructional Materials are done, the same post-test is immediately done, and each class does three post-tests.

Multimedia instructional materials

With "Love Planet Earth" as the topic, three sub-topics are formed, which are "Love Planet Earth--Recycling," "Love Planet Earth--Reducing Garbage," and "Love Planet Earth--Saving Water Resources," to introduce how to carry out recycling of garbage resources, the recycling channels for recycled materials, and issues to be noted when recycling, shown from Figures 1 to Figure 3. The two schools where the experiment is conducted have computers, sound cards, headphones, 15-inch LCD screens, and Windows XP operating systems, all with the same functions. The teacher computers are screen broadcasting system servers, which are connected to the student computers. The playing method is to use the broadcasting system to individually and automatically play different media continuously, to prevent the subjects from controlling the time they have for watching.

"How do we recycle? First let us get to know the 'recycling symbol'"

Figure 1: Instructional Material 1: Group with Pictures, Sounds, and Texts

"The recycling cans we see frequently include the four types with plastic, glass, paper, and metal"

Figure 2: Instructional Material 1: Group with Pictures and Sounds

Figure 3: Instructional Material 1: Group with Pictures and Texts

Testing tools

Pre-test (test on preexisting knowledge): this test was compiled by the researcher, the purpose of which is to understand the preexisting knowledge of the subjects for the content of the experiment, and the test results are used as the covariance, to dispel the influence of preexisting knowledge of subjects on learning results. After expert suggestions, the questions of the pre-test were maintained at 10 yes-no questions, 10 multiple choice questions; each question was one point, for a total of 20 points. The content in the pre-test is connected to basic concepts in environmental protection, recycling, and saving water resources.

Post-test (test on learning accomplishments): this test was compiled by the researcher, the purpose of which is to evaluate learning accomplishments of subjects after they see the experiment content. The test content is compiled based on the experiment instructional materials; the test includes evaluation of three kinds of learning abilities: memory ability, comprehension ability, and transference ability. Among these, memory ability is used to understand the extent to which the subjects can remember the experiment content; comprehension ability is used to understand whether the subjects can absorb and integrate the experiment content, or apply the instructional materials in the experiment to solve problems; transference ability is used to understand how well subjects can apply what they have learned in new contexts.

Administration procedures

The three classes are randomly assigned into Group with Pictures, Sounds, and Texts, Group with Pictures and Sounds, and Group with Pictures and Texts. For three weeks in a row, the three sub-topics are conducted in the three groups, and students watch films on the same morning during the same period. The experiment is conducted in the computer classroom, and subjects carry out the experiment based on randomly assigned group categories. When officially conducting the experimental instruction, in the first week 10 minutes are used for the pre-test, in which the researcher explains the topic of the experiment, telling the subjects to watch the instructional materials for about 6 minutes, immediately after which there will be testing of learning accomplishments for 10 minutes, so subjects are reminded to put on their headphones and focus on watching the multimedia instructional materials and avoid interfering with each other. The whole experiment lasts about 30 minutes.

Results and Discussions

The influence of different multimedia display methods on the learning accomplishments of elementary school students in environmental protection issues

The experiment instructional materials in this study include Love Planet Earth--Recycling, Love Planet Earth--Reducing Garbage, and Love Planet Earth--Saving Water Resources; each set has the three experiment processes of Pictures, Sounds, and Texts, Pictures and Sounds, and Pictures and Texts. The research results are as follows:

One-way ANCOVA is used to dispel the influence of pre-test scores on learning accomplishments, to test for the effect of different multimedia display methods on the learning accomplishments of students on the

environmental protection issues. Test of homogeneity of variance (p>.05) showed that the residual variance of each group in learning accomplishments was the same, and there was homogeneity, as shown in Table 2. Different multimedia display methods reached the level of significance (p<.05) for learning accomplishments, as shown in Table 3. Further pair-wise comparison analysis is shown in Table 4: Love Planet Earth--Recycling pair-wise comparison. The means of the groups showed that Group with Pictures, Sounds, and Texts (16.014) had the best learning accomplishments, followed by Group with Pictures and Texts (14.652), and Group with Pictures and Sounds (12.619) was last. Among them, Group with Pictures, Sounds, and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance; Group with Pictures and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance. Pair-wise comparison of Love Planet Earth—Reducing Garbage resulted in means which showed that Group with Pictures, Sounds, and Texts (15.408) had the best learning accomplishments, followed by Group with Pictures and Texts (15.039), and Group with Pictures and Sounds (13.315) was last. Among them, Group with Pictures, Sounds, and Texts had better learning accomplishments Group with Pictures and Sounds, and reached the level of significance; Group with Pictures and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance. Pair-wise comparison of Love Planet Earth--Saving Water Resources resulted in means which showed that Group with Pictures, Sounds, and Texts (14.777) had the best learning accomplishments, followed by Group with Pictures and Texts (13.612), and Group with Pictures and Sounds (12.420) was last. Among them, Group with Pictures, Sounds, and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance.

Table 2: Tests of homogeneity of variance

Instructional materials	F test	Degree of freedom of numerator	Degree of freedom of denominator	Significance (p value)
Recycling	1.380	2	60	0.259
Reducing Garbage	1.755	2	60	0.182
Saving Water Resources	0.215	2	60	0.808

Table 3: One-way ANOVA of different multimedia display methods

Instructional materials	Source of variance	Type Ⅲ Sum of Squares	Degree of freedom	Mean sum of squares	F value	P value
Recycling	Multimedia group	116.956	2	58.478	8.051	0.001***
	Within group	428.571	59	7.264		

	(error)					
	Sum	13765.000	63			
Reducing Garbage	Multimedia group	49.272	2	24.636	3.345	0.042*
	Within group (error)	434.555	59	7.365		
	Sum	13903.000	63			
Saving Water Resources	Multimedia group	57.897	2	28.949	4.461	0.016*
	Within group (error)	382.880	59	6.489		
	Sum	12101.000	63			

*p <.05 **p <.01

Table 4: Adjusted means of learning accomplishments and pair-wise comparison of different display methods

Content of instructional materials	(I) Group	Mean	(J) Group	Difference of means (I-J)	standard error	Significance
Recycling	Pictures, Sounds, and Texts (n=21)	16.014	Pictures and Sounds	3.395	0.848	0.000***
			Pictures and Texts	1.362	0.835	0.108
	Pictures and Sounds (n=21)	12.619	Pictures, Sounds, and Texts	-3.395	0.848	0.000***
			Pictures and Texts	-2.033	0.867	0.022*
	Pictures and Texts (n=21)	14.652	Pictures, Sounds, and Texts	-1.362	0.835	0.108
			Pictures and Sounds	2.033	0.867	0.022*
Reducing	Pictures,	15.408	Pictures	2.092	0.873	0.020*

Garbage	Sounds, and Texts (n=21)		and Sounds			
			Pictures and Texts	0.369	0.854	0.667
	Pictures and Sounds (n=21)	13.315	Pictures, Sounds, and Texts	-2.092	0.873	0.020*
			Pictures and Texts	-1.724	0.841	0.045*
	Pictures and Texts (n=21)	15.039	Pictures, Sounds, and Texts	-0.369	0.854	0.667
			Pictures and Sounds	1.724	0.841	0.045*
Saving Water Resources	Pictures, Sounds, and Texts (n=21)	14.777	Pictures and Sounds	2.357	0.790	0.004**
			Pictures and Texts	1.165	0.820	0.160
	Pictures and Sounds (n=21)	12.420	Pictures, Sounds, and Texts	-2.357	0.790	0.004**
			Pictures and Texts	-1.192	0.802	0.142
	Pictures and Texts (n=21)	13.612	Pictures, Sounds, and Texts	-1.165	0.820	0.160
			Pictures and Sounds	1.192	0.802	0.142

*p<.05 **p<.01 ***p<.001

Interactive effects on learning memory of different multimedia display methods on students in environmental protection issues

One-way ANCOVA is used to dispel the influence of pre-test scores on learning accomplishments, to test

for the effect of different multimedia display methods on the learning memory of students on the environmental protection issues. Test of homogeneity of variance (p>.05) showed that the residual variance of each group in learning memory, and there was homogeneity. Different multimedia display methods reached the level of significance for learning memory, and reached the level of significance (p<.05), as shown in Table 5.

Love Planet Earth—Recycling comparisons resulted in means which showed that Group with Pictures, Sounds, and Texts (5.284) had the best learning memory, followed by Group with Pictures and Texts (4.818), and Group with Pictures and Sounds (3.898) was last; Group with Pictures, Sounds, and Texts had better learning memory than Group with Pictures and Sounds, and reached the level of significance; Group with Pictures and Texts had better learning memory than Group with Pictures and Sounds, and reached the level of significance. Comparison of means in Love Planet Earth--Reducing Garbage showed that Group with Pictures, Sounds, and Texts (5.313) had the best learning memory, followed by Group with Pictures and Texts (4.651), and Group with Pictures and Sounds (3.656) was last; Group with Pictures, Sounds, and Texts had better learning memory than Group with Pictures and Sounds, and reached the level of significance; Group with Pictures and Texts had better learning memory than Group with Pictures and Sounds, and reached the level of significance. Comparison of means in Love Planet Earth--Saving Water Resources showed that Group with Pictures, Sounds, and Texts (6.197) had the best learning memory, followed by Group with Pictures and Sounds (5.145), and Group with Pictures and Texts (5.134) was last; Group with Pictures, Sounds, and Texts had better learning memory than Group with Pictures and Sounds, and reached the level of significance; Group with Pictures, Sounds, and Texts had better learning memory than Group with Pictures and Texts, and reached the level of significance, as shown in Table 6.

Table 5: One-way ANOVA of learning memory of environmental protection issues in different multimedia display methods

Instructional materials	Source of variance	Type Ⅲ Sum of Squares	Degree of freedom	Mean sum of squares	*F* value	*P* value
Recycling	Multimedia group	14.447	2	7.224	6.890	0.002**
	Interactive effect	5.046	2	2.523	2.406	0.099
	Error	58.712	56	1.048		
	Total	1490.000	63			
Reducing Garbage	Multimedia group	27.369	2	13.684	7.917	0.001**
	Interactive effect	1.733	2	0.867	0.501	0.608
	Error	96.800	56	1.729		
	Total	1428.000	63			

Saving Water Resources	Multimedia group	14.806	2	7.403	4.648	0.014*
	Interactive effect	0.043	2	0.021	0.013	0.987
	Error	89.187	56	1.593		
	Total	2010.000	63			

*p <.05 **p <.01

Table 6: Adjusted means of learning memory and pair-wise comparison of different display methods

Content of instructional materials	(I) Group	Mean	(J) Group	Difference of means (I-J)	standard error	Significance
Recycling	Pictures, Sounds, and Texts (n=21)	5.267	Pictures and Sounds	1.285	0.346	0.000***
			Pictures and Texts	0.489	0.323	0.135
	Pictures and Sounds (n=21)	3.982	Pictures, Sounds, and Texts	-1.285	0.346	0.000***
			Pictures and Texts	-0.796	0.351	0.027
	Pictures and Texts (n=21)	4.778	Pictures, Sounds, and Texts	-0.489	0.323	0.135
			Pictures and Sounds	0.796	0.351	0.027
Reducing Garbage	Pictures, Sounds, and Texts (n=21)	5.456	Pictures and Sounds	1.778	0.451	0.000***
			Pictures and Texts	0.812	0.445	0.073
	Pictures and Sounds (n=21)	3.678	Pictures, Sounds, and Texts	-1.778	0.451	0.000***
			Pictures and Texts	-0.966	0.414	0.023

	Pictures and Texts (n=21)	4.644	Pictures, Sounds, and Texts	-0.812	0.445	0.073
			Pictures and Sounds	0.966	0.414	0.023
Saving Water Resources	Pictures, Sounds, and Texts (n=21)	6.185	Pictures and Sounds	0.971	0.398	0.018*
			Pictures and Texts	1.196	0.433	0.008**
	Pictures and Sounds (n=21)	5.213	Pictures, Sounds, and Texts	-0.971	0.398	0.018*
			Pictures and Texts	0.225	0.427	0.601
	Pictures and Texts (n=21)	4.989	Pictures, Sounds, and Texts	-1.196	0.433	0.008**
			Pictures and Sounds	-0.225	0.427	0.601

*p<.05 **p<.01 ***p<.001

Correlated sample one-way ANOVA for different classes of students undergoing different multimedia display methods

This study uses an improved counter balance design, in which different multimedia display methods are used for the three classes' correlated sample one-way ANOVA, to test for learning accomplishments in different multimedia display methods on environmental protection issues. Mauchly's test values do not reach the level of significance (p>.05), which shows that it did not violate the assumed sphericity of variance analysis and the sample has homogeneity.

Students of the three classes A, B, and C take turns to undergo to instructional materials experiment of different multimedia display methods. The sequence of experiments undergone by Class A was Group with Pictures and Sounds, Group with Pictures, Sounds, and Texts, Group with Pictures and Texts, correlated sample one-way ANOVA reached the level of significance (p>.05) in "sphericity assumed,"

which shows that different multimedia display methods had significant differences in terms of learning accomplishments. Pair-wise comparison shows that, the means of post-test scores of Class A students were in the order of Group with Pictures, Sounds, and Texts (15.143), Group with Pictures and Texts (13.571), Group with Pictures and Sounds (12.238). This shows that Group with Pictures, Sounds, and Texts had better learning accomplishments than Group with Pictures and Sounds as well as Group with Pictures and Texts, and reached the level of significance. Group with Pictures and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance.

The sequence of experiments undergone by Class B was Group with Pictures, Sounds, and Texts, Group with Pictures and Texts, Group with Pictures and Sounds, correlated sample one-way ANOVA reached the level of significance (p>.05) in "sphericity assumed," which shows that different multimedia display methods had significant differences in terms of learning accomplishments. Pair-wise comparison shows that, the means of post-test scores of Class B students were in the order of Group with Pictures, Sounds, and Texts (16.095), Group with Pictures and Texts (15.095), Group with Pictures and Sounds (12.429). This shows that Group with Pictures, Sounds, and Texts had better learning accomplishments than Group with Pictures and Sounds as well as Group with Pictures and Texts, and reached the level of significance.

Group with Pictures and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance. The sequence of experiments undergone by Class C was Group with Pictures and Texts, Group with Pictures and Sounds, Group with Pictures and Sounds, correlated sample one-way ANOVA reached the level of significance (p>.05) in "sphericity assumed," which shows that different multimedia display methods had significant differences in terms of learning accomplishments. Pair-wise comparison shows that, the means of post-test scores of Class C students were in the order of Group with Pictures and Texts (14.952), Group with Pictures, Sounds, and Texts (14.810), Group with Pictures and Sounds (13.524). Group with Pictures, Sounds, and Texts had learning accomplishments that were better than Group with Pictures and Sounds, and reached the level of significance. The Group with Pictures and Texts had better learning accomplishments than Group with Pictures and Sounds, and reached the level of significance. The details are shown in Table 7.

Table 7: Means and pair-wise comparison of learning accomplishments of students in different classes who received different multimedia display methods

Content of instructional materials	(I) Group	Mean	(J) Group	Difference of means (I-J)	standard error	Significance
Class A	Pictures and Sounds (n=21)	12.238	Pictures, Sounds, and Texts	-2.905	0.577	0.000***

			Pictures and Texts	-1.333	0.630	0.047*
	Pictures, Sounds, and Texts (n=21)	15.143	Pictures and Sounds	2.905	0.577	0.000***
			Pictures and Texts	1.571	0.555	0.010**
	Pictures and Texts (n=21)	13.571	Pictures and Sounds	1.333	0.630	0.047*
			Pictures, Sounds, and Texts	-1.571	0.555	0.010**
Class B	Pictures, Sounds, and Texts (n=21)	16.095	Pictures and Texts	1.000	0.569	0.094
			Pictures and Sounds	3.667	0.754	0.000***
			Pictures, Sounds, and Texts	-1.000	0.569	0.094
	Pictures and Texts (n=21)	15.095	Pictures and Sounds	2.667	0.722	0.001***
			Pictures, Sounds, and Texts	-3.667	0.754	0.000***
	Pictures and Sounds (n=21)	12.429	Pictures and Texts	-2.667	0.722	0.001***
Class C	Pictures and Texts (n=21)	14.952	Pictures and Sounds	1.429	0.571	0.021*
			Pictures and Texts	0.143	0.583	0.809
	Pictures and Sounds (n=21)	13.524	Pictures, Sounds, and Texts	-1.429	0.571	0.021*

		Pictures and Texts	-1.286	0.512	0.021*
Pictures, Sounds, and Texts (n=21)	14.810	Pictures, Sounds, and Texts	-0.143	0.583	0.809
		Pictures and Sounds	1.286	0.512	0.021*

*p<.05 **p<.01 ***p<.001

Conclusion

1. Regarding the learning accomplishments of elementary school students who undergo multimedia display methods in the environmental protection issue, Group with Pictures, Sounds, and Texts was significantly better than Group with Pictures and Sounds.
2. Regarding the learning memory of elementary school students who undergo multimedia display methods in the environmental protection issue, Group with Pictures, Sounds, and Texts was significantly better than Group with Pictures and Sounds.
3. Regarding the learning accomplishments of different classes of elementary school students undergoing different multimedia display methods in the environmental protection issue, Group with Pictures, Sounds, and Texts was significantly better than Group with Pictures and Sounds.

Suggestions

1. When designing multimedia instructional materials, social customs should be considered
   Results of this study show that among multimedia display methods, the method of using pictures, sounds, and texts was better than only using pictures and sounds or pictures and texts. This result differs from the multimedia theory of Mayer. When designing instructional materials, other than following multimedia theory in design, text explanations should be added based on the social customs and reading comprehension ability of children in our country, to prevent them from being unable to concentrate due to a sense of avoidance.
2. At the site of instruction, the interactivity of instruction should be emphasized
   When teachers select or create instructional materials, they need to note that multimedia instructional materials are just assistive tools. Instructional films should not be too long, and younger students need more interaction with the instructor. Discussion is necessary to truly understand thoughts of the students.
3. Diverse types of instructional materials should be used for the issue of environmental protection

The instructional materials in this study are the application of multimedia. Since it is important for environmental protection to be practiced in daily life, it is possible to make supplemental instructional materials at the instructional site, and instructional methods such as “personal experience” and “actual visits” should be arranged for practice in daily life as a part of evaluating learning accomplishments.

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Exploring the Relationship between Purpose of Computer Usage and Reading Skills of Turkish Students: Evidence from PISA 2006

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Abstract

Organization for Economic Co-Operation and Development (OECD) has conducted a series of educational assessments in many OECD and non-OECD countries to support their sustainable economic growth since 2000. These assessments are named Program for International Student Achievement (PISA); they focus on the capabilities of 15-year olds in three main subjects: mathematics, science, and reading. PISA also measures students' interests and tendencies toward information and communication Technologies. This study investigates the relationship between Turkish students' reading scores and their use of computers for educational and entertainment purposes by using the data from PISA 2006. In order to examine the relationship between these variables, Structural Equation Modeling (SEM) is used in the study. Results of this study indicate that while the use of computers for entertainment purposes affects students' reading scores positively, the use of computers for educational purposes affects their reading scores negatively.

Keywords: Computer use, PISA-2006, Reading, Structural Equation Modeling (SEM).

INTRODUCTION

It is well known fact that education plays a unique role in individuals' well-being and their contributions to the society. At this point, it can be safely argued that having well-educated young individuals greatly influences the future of a nation (Roberts, 1995). In accordance with this argument, the Organization for Economic Co-Operation and Development (OECD) has conducted a series of educational assessments in many OECD and non-OECD countries to support their sustainable economic growth since 2000. These assessments are named Program for International Student Achievement (PISA); they focus on the capabilities of 15-year olds in three main subjects: mathematics, science, and reading. PISA also measures students' interests and tendencies toward Information and Communication Technologies (ICT), and contains a great deal of data about characteristics of students, families, and schools (OECD, 2006).

Along with many other countries, Turkey has also participated in PISA since 2003 to assess the level of Turkish students' knowledge, figure out the place of their level, and determine the factors of students' achievement in the global world. At the same time, Ministry of National Education (MoNE) initiated an important attempt to change a long held curriculum which could not respond to students' needs anymore. An important part of this process was to integrate Information and Communication Technology (ICT) into education since this age is called the era of Information Technology (IT) (Ministry of National Education, 2005). In this new era, computers and other ICT devices have been introduced into schools, and teachers have been expected to use these devices in their instructions in many countries (Ham & Cha, 2009). In accordance with this trend, almost all schools in Turkey have been equipped with computer technology. Even though it is hard to claim that all teachers effectively use technology as an instructional tool in practice, it is safe to note here that many activities have started to be implemented with computers and other ICT devices in Turkish schools and classrooms. In addition, many students either have their own computers and internet access at home or use internet cafes, which are very common in Turkey. As a result, most students in Turkey can use computers and the internet at various levels, and at least know basic computer components.

In addition to integration of computers into education, it is also obvious that computers have become essential parts of our daily life in the 21st century. People do a variety of their daily activities, including

working, studying, communicating, and entertaining, by using computers. In addition, basic computer skills such as writing documents using in word processors, calculating formulas in excel sheet, and using communication tools, etc., should be known in order to find an occupation in most job markets. Although there is no doubt on that using computer is an essential skill and an important part of education in today's world, it is also necessary for young people to effectively read, write, and communicate with others in order to be successful in their adult life. At this point, reading is known as one of the essential tools for developing an individual's mind and imagination. In addition, having effective reading skills and habits can be a key factor for students to develop their writing and communication skills.

In this context, it could be argued that both being able to use computers for different purposes and having effective reading skills are among the most important characteristics of well-educated people in today's world. Thus, it is very important for Turkey to investigate the relationship between students' computer usage and their reading skills in order to take the necessary steps toward improving students' achievement. At this point, PISA plays a key role as it indicates the students' reading skills and provides sufficient information about their accessibility to and use of computers. However, to our knowledge, most of the existing studies (Aypay, 2010; Ziya, Dogan, and Kelecioglu, 2010; Demir, Kilic, and Unal; 2010; Alacaci and Erbas, 2010; Anil, 2009; Unal and Demir, 2009; Altun, 2007; Ciftci, 2006; Duman, 2006; Yilmaz, 2006; Erbas, 2005) which investigated performance of Turkish students in PISA assessments focused on either students' math or science achievement by ignoring their reading skills. It is very interesting to see that there are not many previous studies (if there is any) investigated the reading performances of Turkish students in these assessments. Hence, it can be claimed that there is an important gap in the literature in terms of analyzing Turkish students' reading performance in PISA and investigating the factors which may affect students' performance in reading. To this end, this study addresses how using computers for different purposes may affect Turkish students' reading scores, by using the data from PISA-2006.

METHODOLOGY

Participants

Turkey has participated in PISA since 2003. However, only data from 2003 and 2006 cycles is currently available for Turkey, since the data of PISA 2009 has not yet been released. Hence, the latest available data, from PISA 2006, was used in this study. PISA 2006 was implemented in a stratified random sample at 160 schools across 78 provinces in seven geographical regions of Turkey. For implementation of PISA 2006, 35 students from a list of all 15-year-old students in each school were randomly selected. The Turkish data for PISA 2006 had a sample of 4942 fifteen-year-old students (2290 girls and 2652 boys) attending 7^{th} (n=23), 8^{th} (n=93), 9^{th} (n=2007), 10^{th} (n=2671) and 11^{th} (n=148) grades.

Measurement and Variables

Using computer of different purposes was selected as independent variables in this study to predict the Turkish students' reading performance. Five plausible reading values showing the students' reading performance in PISA 2006 was used as dependent variables. To identify students' use of computers for education and entertainment purposes, eleven variables were determined by using a rotated component matrix in factor analysis, as detailed below. These 11 variables about the use of computers for entertainment and educational purposes are shown in Table 1. Three latent variables were generated in order to employ Structural Equation Modeling (SEM) in this study using the dependent and independent variable. The first latent variable has three indicators, including 5 reading scores, which is called READ. The second one has three indicators, including 6 variables about the use of computers for entertainment purposes, which is called ENT. The last one has also three indicators, including 5 variables about the use computers for education purposes, which is called EDU.

Table 1: Variables about the Use of Computers for Different Purposes

(IC4a) Browse the Internet for information about people, things, or ideas[2]
(IC4b) Play games[2]
(IC4c) Write documents[1]
(IC4d) Use the Internet to collaborate with a group or team[2]
(IC4e) Use Spreadsheets[1]
(IC4f) Download software from the Internet (including games)[2]
(IC4g) Drawing, painting or using graphics programs[1]
(IC4h) Use educational software such as Mathematics programs[1]
(IC4i) Download music from the Internet[2]
(IC4j) Writing computer programs[1]
(IC4k) For communication (e.g. Email or "chat rooms")[2]

Notes:
[1]Using computers for education purposes
[2]Using computers for entertainment purposes

Procedures for Data Analysis

Regression analysis is frequently used to examine the relationship between a dependent variable and independent variables. However, in this study, Structural Equation Modeling (SEM) was chosen because SEM enables us to flexibly and powerfully examine the relationships between observed and latent variables (Kline, 2010). While the regression approach to modeling does not allow working with latent variables and measurement error, the techniques in SEM make possible taking measurement error into account and working with latent variables when the data is statistically analyzed (Schumacker & Lomax, 2010).

After determining the number of latent constructs by using a rotated component matrix, parceling techniques, which offer many advantages to researchers, were applied. Parceling, the average (or sum) of two or more items, responses, or behaviors, is a technique commonly employed and suggested by experts (Little, Cunningham, Shahar, & Widaman, 2002). Parceling has two very important advantages: 1) The sum of many items is more representative than only one item; and 2) aggregating items yields greater precision. Moreover, parceling contributes to reductions in sampling error. The score reliability of parcels (total scores) tends to be greater than that for the individual items (Kline, 2010). There are some techniques to create parcels for each construct. In this study, the balancing technique (unidimentional) and the facet representative parcels technique (multidimentional) were performed by using SPSS 18.0. The number of indicators was decreased to three for each latent variable by using these two techniques. Table 2 indicates latent variables and indicators.

Table 2: Parceling for each latent variable

	Parcel 1	Parcel 2	Parcel 3
ENT	IC4a & IC4k	IC4b & IC4f	IC4d & IC4i
EDU	IC4c & IC4e	IC4g & IC4h	IC4j
READ	R1 & R2	R3 & R4	R5

RESULTS

Lisrel 8.8 student version was used in this study. There are two parts in analysis: Model-fit and regression. The first part of analysis is to determine whether the model fits well in structural equation modeling (SEM), is presented in Figure 1.

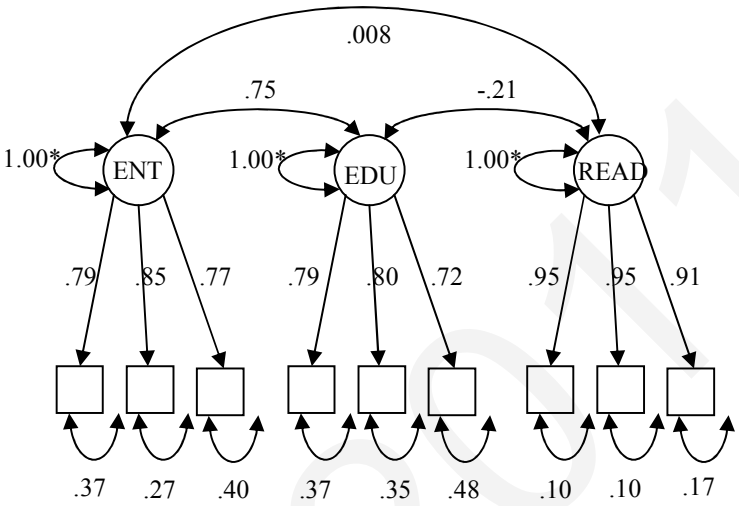

Figure 1: Structural Equation Modeling

Results showed that the model demonstrated acceptable fit (χ^2 (48, 4942) = 270.4, p=<.001, RMSEA=.065$_{(.050-.070)}$, NNFI=.97, CFI=.98), which leads us to apply regression analysis as second part of analysis by using SEM. Regression analysis was to determine if the use of computers for different purposes affected the students' reading scores. The results of this analysis showed that (R^2=.09), ENT affected READ positively (β_1=.375) while EDU affected READ negatively (β_2 = -.499). Figure 2 shows the correlations between latent constructs.

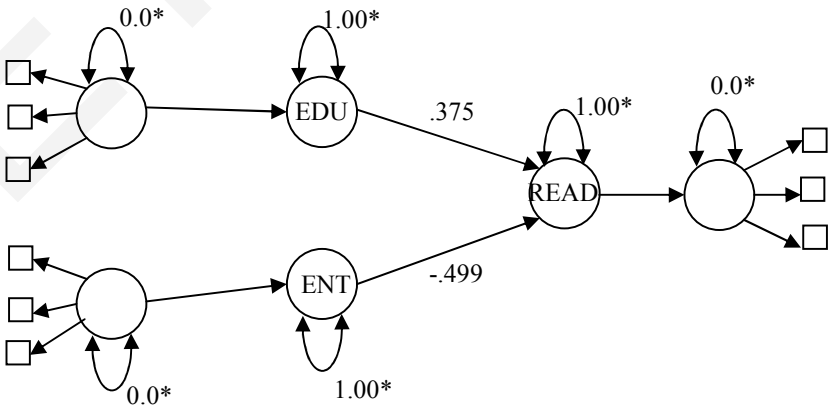

Figure 2: Regression in SEM

CONCLUSION

The purpose of this study was to find out how the use of computers for entertainment and education purposes influences students' reading performance in Turkey. With this aim, the relationship between Turkish students' reading scores in PISA 2006 and their purposes of computer use was examined. Structural Equation Modeling (SEM) was used for the analysis because SEM enabled us to apply the regression model in this study and made possible exploring the relationship among latent constructs. The findings of this study show that while the use of computers for education purposes influenced students' reading scores negatively, the use of computers for entertainment purpose affected reading scores positively. These findings are consistent with the findings of two previous studies (Ziya, Dogan, & Kelecioglu, 2010; Erbas, 2005), which respectively investigated the relationship between Turkish students' mathematics and science performance in PISA and their purpose of using computers.

In general, our findings suggest that students who use computers to perform more advanced tasks show less achievement in reading. At this point, one could argue that these students devote too much time to learn and perform these advanced tasks on computers, and this process may prevent them for reserving enough time for doing their homework and reading different materials. On the other hand, using computers for entertainment purpose may reduce students' stress, increase their motivation, and enable them to study more efficiently. Furthermore, students who use computers for gaming, chatting with friends, or surfing on the internet may unintentionally develop their reading skills. These entertainment activities may also enable students to read in detail and think critically, which are necessary for understanding the context of a reading.

There are also some limitations in this study. First, the findings of this study cannot be generalized to other countries since the sample of the study only included 15-year-old students from Turkish high and middle schools. Second, PISA 2006 included a limited number of questions concerning students' purposes of computer use. Hence, the number of independent variables in this study might not be sufficient to show the relationship between the use of computers for different purposes and reading scores. Third, several previous studies showed that gender as an important predictor of students' achievement in standardized tests (Chiu & McBride-Chang, 2006) and students' attitudes toward use of computers (Lily, 1994). Hence, gender differences should be also taken into account when investigating the relationship between computer use and reading skills. We are currently working on adding gender into our study in order to see if the relationship between computer use and reading skills differ for female and male students. Despite these limitations, the sample size was adequate (n=4952) for employing SEM in this study, and by using the flexible SEM framework, the process of exploring the interrelationships between purposes of computer use and their reading skills has begun.

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FACTORS AFFECTING THE E-LEARNING IN THE MIDDLE EAST: JORDAN SCHOOL CASE STUDY

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***Abstract*—Innovation in learning is always the main interest of any educational institute to develop their learning models. E-learning is one of the most innovative models in education. This paper investigates and analysis the factors that influence the adoption of e-learning systems in Jordan as one of the third developing countries. The investigation has been done in the high schools, public and private.**

A new model has been presented in this research. The results of this research has been shown that the legislations issues, human factors, infrastructure, economics and web content had a significant impact on learning goals and objectives. Therefore it is difficult to have a complete e-learning system in Jordan schools. The novel contribution of this research is achieved by using the results of investigations and analysis to assist in building of a theory that will be tested through quantitative methods in the future.

Keywords: E-learning; School; Qualitative Research; Jordan

I. INTRODUCTION

The concept of the learning [1, 2] has grown exponentially with the technological era related that today, corporate learning and the corporate learning organization have ascended to a position of strategic status in the context of managing and growing the project. Identification the knowledge-based economy, the paradigm shift in the way education is viewed and delivered, and huge knowledge gaps as significant trends that have given rise to e-learning [3]. The increase in complexity and velocity of the work environment brought about by technological changes are also major issues that have fueled the demand for e-learning. The shift from the industrial to the knowledge era is presented by [2]. Rapid technological change, the ever shortening product developmental cycles, lack of skilled personnel, enterprise resource planning, and migration towards value chain integration and the extended enterprise as being prominent contributors to the e-learning value chain. The robust economy and the increasingly competitive global business environment as central to the e-learning movement is recognized by [2, 4] .

These composed trends which contribute in driving e-learning systems and show the importance and benefits of e-learning which increases the adoption for this new technology and speedup motivation for creating a new e-learning model in Jordan.

Very few researches study the adoption and use of e-learning technology in the third developing countries. It is very important to reveal that the new technology adoption might be completely different from country to country and from nation to nation. Therefore, this research investigates the factors that influence this variety in the adoption of e-learning systems.

This paper begins with the definition of e-learning. The second part explains the diversity of e-learning practices in terms of persons, computer and technology literacy and social factors. The third part explains a comparison between traditional education and e-learning. In addition, the objectives, advantages and disadvantages of e-learning are outlined after the quality and content section.

II. E-LEARNING DEFINITIONS

The term of e-learning involves using the Internet as a communications medium where the instructor and students are separated by physical distance [5].

While‘‘online’’,’’technologically-integrated’’,’multimedia-based’’,and "e-learning’’ are familiar terms that describe a new approach to instructional delivery. Studies show that schools quickly adopt these delivery modes. Analysts of this growth estimate that online learning is increasing 30-40 percent annually [6]. E-learning 'is a complement to other forms of learning and not a replacement. It should form part of an articulated approach to learning'[7].

III. THE DIVERSITY OF E-LEARNING PRACTICES

No educator will be especially surprised to learn that success in a Web-based learning environment is heavily influenced by what the student brings to the learning situation. There is evidence that students with certain learning styles (e.g., visual) or behavioral types (e.g., independent) do learn better in the Web environment. Conversely, aural, dependent and more passive learners may not do as well. It is this sort of insight that leads some to propose that the potential for maximal learning results when instructional approaches are matched to student learning styles and are supported by appropriate technologies [8]. Furthermore, students with a high motivation to learn can do better by learning online and they will be more independent.

"Our brains may also be the reason why we can become so involved with our computers. As a result of 35 laboratory studies, [9] (1996) concluded that it is the psychology of the relationship between us and the computer that is important, not the fact that one member of this so-called relationship is a piece of technology. They came to this conclusion after experiments where subjects were asked by the computer to evaluation its work. Subjects responded politely and seemed not to want to hurt the computer's feelings. But, when asked by one computer to Evaluation another's work, subjects were more likely to offer criticism"[10].

"Social presence" (i.e., the degree to which a person is perceived as real in an online conversation) is a strong predictor of satisfaction with computer-mediated communications [11]. This skill the production of "immediacy behaviors," since they reduce the "social distance" between teachers and students. In this study, these types of behaviors were positive predictors of student learning and course satisfaction [12].

IV. QUALITY AND CONTENT:

One of the most natural questions that is raised regarding online education (or any educational innovation) is whether it is effective or more effective than what is currently in place? in the case of online education , many comparative studies have been conducted and more are being undertaken to show that online learning produces equivalent or superior educational results to traditional face to face instruction ..., in general the question of whether e-learning is as effective as face-to-face learning has largely been answered by advocates of e-learning with a yes ,''nearly all comparative studies show that e-learning is as effective as classroom instruction'' [13]. In order to make online education work efficiently, large number of students must enroll in courses and degree programs taught by relatively few faculty assisted by teachers aides [14]. Using e-learning technology and innovations in learning methodologies can assist many students to achieve and gain multiple learning goals and objectives.

In any remoteness education situation we need to remember that students are not electronic machines, they are human beings with their proper educational needs and cultural context. E-learning platforms are useful tools to help learners to accomplish their educational and learning activities, to instruct at a distance, to overcome time and space barriers. E-learning platforms do not substitute the human part of the educational process of teaching and learning [15].

Table (1) Description of the Objectives, Advantages and Disadvantages of using E-learning System in school.

Attributes description	Details
E-learning purposes and objectives	Providing a platform to enhance both traditional face-to-face and e-learning system for students. New learning models are needed to bridge the skills gap and demographic changes. Solving Limitations of both time and physical space in the classical learning, Expanding the learning opportunities of students who are facing difficulties that are preventing them from attending traditional one. With the multi platform e-learning environment learning would occur at any time during the day and from any where in the world. Private educational school competitive highly desire Provides flexibility, efficiency and using workflow functionality application [16].
E-learning advantages	E-Learning as a solution to National Specific Problems [17]: Over-crowded classrooms. High price of traditional educational books. Chance for talented students. Active participation in the international educational community. Enhancing the level of national education . E-learning system advantages for student: Building programmed work for students with the excellent support of educated websites made the task of e-learning easier [18]. Provide guidance for students depends on the level in which this

	application is integrated in to teaching [18]. Encourage students to become more autonomous learners Encourage students to make a different kind of use of both contact and non-contact time. In order for students to take full advantage of many of the e-learning innovations and technologies

In this work the main problem is building a new educational learning model. The degree of adoption of the new technology and the trends driving e-learning system including the difficulties forces implementation in our country as a part of the Arab region and Middle East are taken into consideration. The model consists of several variables depending on the real requirements and demands of the schools within the available resources and environment.

It is obvious that e-learning implementation has many factors that can change the attitude of the people to adopt this new model of education. It is so difficult to cover all the factors; the researchers study the factors within public and private school in Jordan in e-learning implementation. The next section explains this case.

V. CASE STUDY: PUBLIC SCHOOL

The growing of technology knowledge underpins schools represented by the ministry of education) to adopt new vision for learning. This vision is implementing the e-learning principles in schools through different phases.

The ministry of education (school) implemented the e-learning project in three phases. The first phase is the establishment of the infrastructure and content.

The second phase is the use of Eduwave (http://elearning.jo) as a supportive tool for the traditional education. It is done through using Internet and other multimedia tools. Finally, the third phase that is:

Migrate from simple supportive e-learning tool using eduwave to a complete content of e-learning system. It provides e-learning content, virtual class system, e-exam, e-video and studio, electronic content management, sharing tools and all the management works for the schools in Jordan.

A. The ministry of education (school) strategies to migrate to a new e-learning system:

Establishment of special building centre for the e-learning project. This centre will manage every thing related to that project such as the staff and infrastructure (king Rania center).

Establish of new schools buildings that have all the infrastructure for the e-learning (labs, wireless node) so the teachers and students can access the system from any where inside the school. Purchasing of e-learning system that can basically be operated under windows. Training of teachers (ICDL, Intel, word links, high diploma in IT) during the last years. And this training extended to all whom engaged in the e-leaning system.

VI. THE RESEARCH METHODOLOGY

A qualitative research was used for induction [19, 20]. That is, the qualitative approach to data collection discovers information from the perspective of the interviewee about the phenomena, such as behaviors and attitudes, that are not directly observable, that is, 'in someone else's mind' [21]. The findings of the qualitative research are not used to test a theory and make generalizations about a population; but rather, to build a theory for further testing, through quantitative methods [22, 23, 24, 25].

This induction characteristic of qualitative methods was a requirement for the first stage of this research for two reasons. Firstly, e-Learning systems in an Internet environment are a relatively new topic in Jordan and Arab region public and private school. In the early stages of theory development, where phenomena are not well understood and the relations between phenomena are not known, in advance used quantitative research methods can lead to inconclusive answer [26]). A qualitative method was required to explore this complex topic in depth with experts who have studied and/or applied (teachers, students and technical's) their knowledge practically to generate ideas rather than to evaluate ideas. That is, qualitative research allowed for flexibility in the gathering of information and a Semi-Structured exploration of issues in a less structured format, with a smaller number of respondents than quantitative methods [20, 27]. This information will be used to assist in the building of a theory that will be tested through quantitative methods in the next method of this research. The second reason for using a qualitative method was the type of information this research is intended to gain in the first stage of data collection. The depth and detail of qualitative data required to understand complex phenomena can be obtained only by getting psychologically close to the phenomena under study. 'The closer the researcher gets to the phenomenon, the clearer it is understood' [28]. Qualitative research allowed us to a gain semi-structured understanding of underlying reasons and motivations and to obtain 'rich', 'real', and 'deep' information with 'non-statistical' data analysis [29]. In summary, the complexity of the research subject warranted a semi-structured exploration that is only possible through qualitative research in the first stage of this research.

This research utilizes an unstructured interview with the Information and Communication technology in Education (ICTE) students in Jordan University. They are teachers in high schools and professional. They are using the e-learning system that is implemented by the ministry of education in their schools.

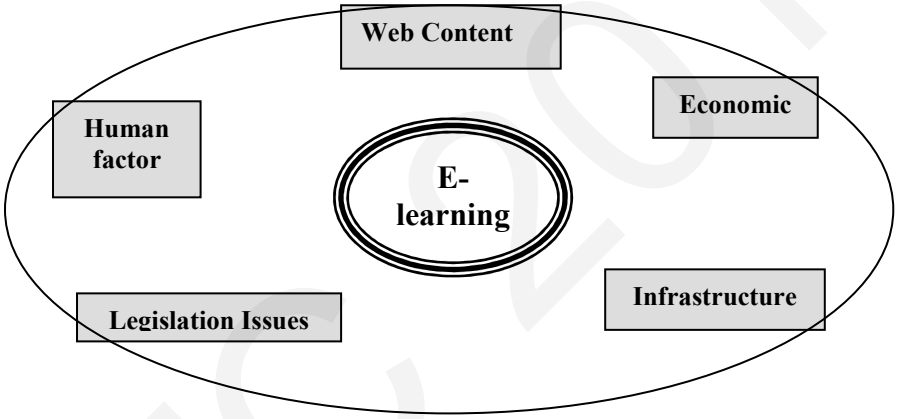
The researchers use each interview for collecting the information required from the respondents and in explaining the data results [28, 30]. The unstructured interview is often seen as an informal interview that is not structured by the standard list of questions. Field-workers are free to deal with the topics of interest in any order, and to phrase their questions as they think is best suited [31]. An unstructured interview is particularly useful for a preliminary study in order to test what the responses might be to a particular issue [32]. In this phase, the researchers asked those teachers who are content developers and users of e-learning system open-ended questions. Although the researchers knew what they wanted, the open-ended questions enabled the researchers to obtain what they were looking for.

The answers of the questions are summarized and analyzed with the cooperation of the interviewed teachers. The analysis focused on the frequencies of concepts in answers and how they are related to each other. Again, the derived concepts are discussed with the interviewed teachers and filtered.

The result is a framework depicts the main factors that influence the e-learning adoption in high schools. This framework is being discussed and approved by the interviewed teachers.

VII. The Result of Analysis

The Factors of E-learning Adoption Model in Jordan schools.



VIII. Discussion:

This research represents a practical investigation into factors and characteristics that influence the new e-learning model.

As seen in our new model in, the legislations issues, human factors (training, resistance), Infrastructure, Economic and web content (Language option, Multimedia, Content quality) had a significant impact on learning goals and objectives in our study.

The rare of legislations that control the use of Internet and guarantee the security and privacy of whom use the Internet were restrict the access of students to the e-learning system. Moreover, the students have not always a reliable access to the Internet. The reliable access is a coherent connection to Internet, continually web site updating, and reasonable server on-line service.

The legislations of the Ministry of Education in Jordan require students' attendance to class's requirement for competitions of there study and the teacher can't develop there own e-learning object and if they do they can't use it inside the school. As a result of that, it is difficult to have a complete e-learning system in Jordan schools.

According to both user and developer, the main barrier is the minds and resistance of change to adopt any new technology. They suggest to have enough training to use a system for both students and teachers and we add the technical's persons of the school who response about the labs in each school, as well as have ICDL as basic requirement for a job and promotion...

The technical infrastructure influences the adoption of e-learning in Jordan high schools. There is a shortage in the infrastructure. The numbers of PCs, laptops, and data shows are inadequate. Furthermore,

the internet connection in the schools is not reliable, as well as the equipped halls/labs for e-learning are inadequate, for example; in many schools, one computer for three students.

For most of teachers and students, the economic factor influences the e-learning adoption. The economic factor is the income of the both teachers and students. Therefore, these people are not capable to have computers and internet connection in their homes. Nevertheless, very few students and teachers have computers, they are not able to connect them to internet through broadband line or even dial-up connection.

The most common complaint from user view was the English language of application. The majority of e-learning systems do not provide a language options to an end users. Therefore, students and teachers will not be capable to understand the instructions and manuals related to the system and that will influence their attitudes to use the system. The interactive interface is not always available and that will not make the learning process interesting, especially the majority users of such systems who are between 12-18 years old. They are used to play games with many interaction options and when they use the e-learning system with few or non interaction options, they feel bored. Course's content and materials which are shown on the web are neither high quality nor new. The high quality courses content is the newest edition books, chapters' slides, online practice exams, paper practice exams, courses' timetables, and interactive tools related to courses such as animations, pictures, and sounds.

Our study yield information that may be useful in guiding for extra and future research. It addresses the realistic key factors that are essential to adoption and effective integration of e-learning strategies, initiatives, and programs for schools in our country.

IX. CONCLUSION

By incorporating e-learning innovations and technologies, students have other learning ways and alternatives. They assist them in meeting the changing demands of the marketplace where complex problems and uncertainty are ever present. Just as ministry of education must find creative ways to continue their competitive edge through the introduction of new technologies and services, schools should take practical steps towards meeting the needs of their students. Introducing e-learning tools and resources may be one way that assists students in achieving the multiple learning goals of exploration, communication, and collaboration beyond the framework and boundaries of the traditional classroom. Our research is preliminary an investigation for the factors that influence the adoption of e-learning systems, as well as seeking information about fact which has not been tested yet in the study domain literature. For that reasons, this information will be used to assist in building of a theory that will be tested through quantitative methods in the future.

X.

XI. 10. LIMITATIONS OF THE RESEARCH

As results for this research, there is a list of limitations for adopting of e-learning in Jordan schools

- Process of integration of the e-learning system is still at the beginning.
- E-learning systems within the Jordanian schools are almost not used as it proposed to be used.
- The teachers teaching load is high and thus slow down the adoption of e-learning system.
- The limited budgets and experts of such projects lead into implementation delay, insufficient training, and late adoption.
- Most of the Learning Objects LO of e-learning is not tested well.

The limitations are opening new opportunities for new researches that can contribute more to our knowledge. This section suggests related areas of research where additional investigation may be rich. It will be a good contribution, if the factors of e-learning adoptions model are validated with all schools, public and private in Jordan. In addition, this model can be checked with any adoption theory. Therefore, we can test to what extent these factors affect the adoption.

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FACULTY OF EDUCATION STUDENTS' ATTITUDES TOWARD COMPUTER AND MAKING COMPUTER SUPPORTED EDUCATION

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ABSTRACT

The purpose of this study is to investigate the students' attitudes toward computer, their attitudes toward making computer supported education, and the correlation between these two attitudes. The study was carried out with 220 students attending to department of classroom teacher. At the end of the study it is determined that, sophomore students compared to freshman students and male students have significantly higher attitudes toward computer. Apart from the exceptions, students' attitudes toward computer are increasing significantly while their computer lesson achievement scores are rising. Junior students have significantly higher attitudes toward making computer supported education. Apart from the exceptions, the students getting high achievement scores in computer lesson have significantly higher attitudes toward making computer supported education. Students' genders don't affect their attitudes toward making computer supported education. Significant and moderate correlation is determined between the students' attitudes toward computer and their attitudes toward making computer supported education.

Keywords: Faculty of education students, computer, computer supported education, attitude.

INTRODUCTION

The influence of the computer is constantly increasing in life. In industrial societies, students don't react in same extent to the expansion of computers and new technologies. But some of them can gain different attitudes and avoid being confronted with the computers and new technologies (Richter, Naumann & Groeben, 2000). Personal attitude is a major factor to affect not only the acceptance and individual usage of computer (Liaw, Huang & Chen, 2007) but also learning environments, such as using a computer as a learning tool introducing computer based applications (CBA) into the classroom (Roussos, 2007). It is likely that the students' attitudes toward CBA and learning about computers may be important in the adaptation of computer technologies into the classroom (Teo, Lee, & Chai, 2008). It is believed that computer attitudes play an essential role in determining the extent to which students use the computer as a learning tool (Teo, 2006) and organizing future behaviors toward the computer technology (Huang & Liaw, 2005; Rosen & Weil, 1995). This attitude–behavior correlation has been investigated by researchers who are studying about affective reactions of students toward technology (Fiore, Yah, & Yoh, 2000; Sanders & Morrison-Shetlar, 2001). Among these reactions, technofobia affecting attitudes and educational practices related to computer should be taken into consideration. So we need to assess and measure individuals' attitudes toward computers in order to determine the extent of the problems and to find solutions (Garland & Noyes, 2008). Increasing use of computers in an educational environment also drove the research agenda (Garland & Noyes, 2008) and different reactions of people requires studying on attitudes toward the computer (Richter, Naumann & Groeben, 2000). Thus, understanding users' attitudes toward computers provides the creation of appropriate CBA for teaching and learning (Liaw, Huang & Chen, 2007). In this context, the problem of present paper is designated about the students' attitudes toward computer and making computer supported education.

PURPOSE

The main purpose of this study is to investigate faculty of education students' attitudes toward computer and making computer supported education. The following questions are answered to realize this purpose:

1.Are there meaningful differences between the students' attitudes toward computer according to their (a) genders, (b) class levels, (c) computer lesson academic achievement scores?

2. Are there meaningful differences between the students' attitudes toward making computer supported education according to their (a) genders, (b) class levels, (c) computer lesson academic achievement scores?

3. Is there meaningful correlation between the students' attitudes toward computer and their attitudes toward making computer supported education?

METHODOLOGY

This study is modelled as a descriptive research. The population of the study consists of faculty of education students attending to department of classroom teacher in University of Çukurova during 2010-2011 education year. The sample of the study is determined by random selection among this population and consists of totaly 220 freshman, sophomore and junior students.

As data collection tools, "The Attitude Scale Toward Computer" (Berberoğlu & Çalıkoğlu, 1991) and "The Attitude Scale Toward Making Computer Supported Education" (Arslan, 2006) are used. The Attitude Scale Toward Computer was developed by Loyd and Gressard (1984) and the scale was adapted into Turkish by Berberoğlu and Çalıkoğlu (1991). The scale includes 40 items and the items are arranged for scoring on a five-point Likert scale ranging as "strongly agree, agree, not certain, disagree, strongly disagree". Berberoğlu and Çalıkoğlu determined the Cronbach's Alpha coefficient for whole scale as .90. In this study, Cronbach'a Alpha of whole scale is calculated as .94. These results shoms that the scale is reliable enough.

The Attitude Scale Toward Making Computer Supported Education was developed by Arslan (2006). The scale includes 20 items and the items are arrenged for scoring on a five-point Likert scale ranging as "strongly agree, agree, not certain, disagree, strongly disagree". Arslan (2006) determined the Cronbach's Alpha coefficient for whole scale as .93. In this study, Cronbach'a Alpha of whole scale is calculated as .89. These results shoms that the scale is reliable enough.

During application process of these scales, data about the individual informations of the students were collected such as genders, class levels, computer lesson academic achievement scores. The collected data was analysed by using independent samples t-Test, ANOVA and pearson correlation methods via SPSS 11.5 (Büyüköztürk, 2010).

FINDINGS

1.The findings for the differences between the students' attitudes toward computer in terms of their genders

Independent samples t-test findings for the differences between the students' attitudes toward computer in terms of their genders are given in Table 1.

Table 1
Independent Samples T-Test Findings For The Differences Between The Students' Attitudes Toward Computer In Terms of Their Genders

Gender	N	$\overline{X}$	S	df	t	p
Male	68	158.11	19.68	218	2.38	.018
Female	152	151.45	18.91			

As seen in Table 1, there is meaningful difference between the male ($\overline{X}$ = 158.11) and female ($\overline{X}$ =151.45) students' attitudes toward computer in favor of male students, $t(218)=2.38$, $p< .05$.

2.The findings for the differences between the students' attitudes toward computer in terms of their class levels

ANOVA findings for the differences between the students' attitudes toward computer in terms of their class levels are given in Table 2.

Table 2
ANOVA Findings For The Differences Between The Students' Attitudes Toward Computer In Terms of Their Class Levels

Class level	N	$\overline{X}$	S	Source	Sum of Squares	df	Mean square	F	p	Meaningful differences
Freshman	102	148.94	21.02	**Between subjects**	5010.29	2	2505.14	7.053	.001	Freshman~ Sophomore
Sophomore	63	160.24	15.76	**Within subjects**	77076.045	217	355.18			
Junior	55	154.27	17.76	**Total**	82086.34	219				
Total	220	153.51	19.36							

As seen in Table 2, there is meaningful difference between the students' attitudes toward computer in terms of their class levels, $F(2, 217)=7.053$, $p< .01$. LSD post hoc test was used to determine the sources of the differences and according to LSD test, meaningful difference is found between the freshman ($\overline{X}$ =148.94) and sophomore ($\overline{X}$ = 160.24) students' attitudes toward computer in favor of sophomore students.

3.The findings for the differences between the students' attitudes toward computer in terms of their computer lesson academic achievement scores

ANOVA findings for the differences between the students' attitudes toward computer in terms of their computer lesson academic achievement scores are given in Table 3.

Table 3
ANOVA Findings For The Differences Between The Students' Attitudes Toward Computer In Terms of Their Computer Lesson Academic Achievement Scores

Academic achievement score	N	$\overline{X}$	S	Source	Sum of Squares	df	Mean square	F	p	Meaningful differences
(1) FD_DD (30-59)	19	141.54	20.64	Between subjects	10992.72	5	2198.54	6.618	.000	1~3 1~5
(2) DC (60-69)	40	147.80	20.97	Within subjects	71093.61	214	332.21			1~6 2~5
(3) CC (70-74)	79	156.71	17.72	Total	82086.34	219				2~6
(4) CB (75-79)	37	147.42	19.67							3~4
(5) BB (80-84)	25	159.46	14.11							3~6
(6) BA_AA (85-100)	20	167.47	12.69							4~5
Total	220	153.51	19.36							4~6

Because of insufficient number of students in the groups [FD (N=4), DD (N=15), BA (N=15), AA (N=5)], FD and DD groups, BA and AA groups are integrated. As seen in Table 3, there are meaningful differences between the students' attitudes toward computer in terms of their computer lesson academic scores $F(5, 214)=6.618$, $p< .001$. LSD post hoc test was used to determine the sources of the differences and according to LSD test, significant differences are found between the students of these groups: Between FD_DD ($\overline{X}$ = 141.54) and CC ($\overline{X}$ = 156.71) in favor of CC; FD_DD ($\overline{X}$ = 141.54) and BB ($\overline{X}$ = 159.46) in favor of BB; FD_DD ($\overline{X}$ = 141.54) and BA_AA ($\overline{X}$ = 167.47) in favor of BA_AA; DC ($\overline{X}$ = 147.80) and BB ($\overline{X}$ = 159.46) in favor of BB; DC ($\overline{X}$ = 147.80) and BA_AA ($\overline{X}$ = 167.47) in favor of BA_AA; CC ($\overline{X}$ = 156.71) and CB ($\overline{X}$ = 147.42) in favor of CC; CC ($\overline{X}$ = 147.42) and BA_AA ($\overline{X}$ = 167.47) in favor of BA_AA; CB ($\overline{X}$ = 147.42) and BB ($\overline{X}$ = 159.46) in favor of BB; CB ($\overline{X}$ =147.42) and BA_AA ($\overline{X}$ = 167.47) in favor of BA_AA. According to these findings it may be thought that apart from the exception such as the differences between CC and CB in favor of CC, generally students' attitudes toward computer are increasing significantly while their computer lesson achievement scores are rising.

4.The findings for the differences between the students' attitudes toward making computer supported education in terms of their genders

Independent samples t-test findings for the differences between the students' attitudes toward making computer supported education in terms of their genders are given in Table 4.

Table 4
Independent Samples T-Test Findings For The Differences Between The Students' Attitudes Toward Making Computer Supported Education In Terms of Their Genders

Gender	N	$\overline{X}$	S	df	t	p
Male	68	84.26	9.77	218	1.65	.099
Female	152	82.06	8.75			

As seen in Table 4, there isn't meaningful difference between the male ($\overline{X}$ = 84.26) and female ($\overline{X}$ =82.06) students' attitudes toward making computer supported education, $t(218)=1.65$, $p>.05$.

5.The findings for the differences between the students' attitudes toward making computer supported education in terms of their class levels

ANOVA findings for the differences between the students' attitudes toward making computer supported education in terms of their class levels are given in Table 5.

Table 5
ANOVA Findings For The Differences Between The Students' Attitudes Toward Making Computer Supported Education In Terms of Their Class Levels

Class level	N	$\overline{X}$	S	Source	Sum of Squares	df	Mean square	F	p	Meaningful differences
Freshman	102	81.17	9.82	Between subjects	874.65	2	437.32	5.473	.005	Fresman~Junior Sophomore~Junior
Sophomore	63	82.36	8.46	Within subjects	17340.82	217	79.91			
Junior	55	86.08	7.62	Total	18215.48	219				
Total	220	82.74	9.12							

As seen in Table 5, there are meaningful differences between the students' attitudes toward making computer supported education in terms of their class levels, $F(2, 217)=5.743$, $p< .01$. LSD post hoc test

was used to determine the sources of the differences and according to LSD test, meaningful differences are found between the attitudes of freshman ($\overline{X}$ = 81.17) and junior ($\overline{X}$ =86.08) students, between the attitudes of sophomore ($\overline{X}$ = 82.36) and junior ($\overline{X}$ =86.08) students toward making computer supported education in favor of junior students in both differences. According to these findings it may be thought that students' attitudes toward making computer supported education are increasing significantly while their class levels are rising.

6.The findings for the differences between the students' attitudes toward making computer supported education in terms of their computer lesson academic achievement scores

ANOVA findings for the differences between the students' attitudes toward computer in terms of their computer lesson academic achievement scores are given in Table 6.

Table 6
ANOVA Findings For The Differences Between The Students' Attitudes Toward Making Computer Supported Education In Terms of Their Computer Lesson Academic Achievement Scores

Academic achievement score	N	$\overline{X}$	S	Source	Sum of Squares	df	Mean square	F	p	Meaningful differences
(1) FD_DD (30-59)	19	78.47	8.75	Between subjects	1299.15	5	259.83	3.28	.007	1~6 4~6
(2) DC (60-69)	40	82.36	11.23	Within subjects	16916.32	214	79.04			
(3) CC (70-74)	79	83.78	7.24	Total	18215.48	219				
(4) CB (75-79)	37	79.86	11.18							
(5) BB (80-84)	25	83.39	7.56							
(6) BA_AA (85-100)	20	87.95	5.81							
Total	220	82.74	9.12							

Because of insufficient number of students in the groups [FD (N=4), DD (N=15), BA (N=15), AA (N=5)], FD and DD groups, BA and AA groups are integrated. Beside, due to the meaningful difference of the Levene statistic (p= .025), Dunnett C was prefered as post hoc test. As seen in Table 6, there are meaningful differences between the students' attitudes toward making computer supported education in terms of their computer lesson academic scores $F(5, 217)=3.28$, $p< .01$. According to Dunnett C test, significant differences are found between the students of these groups: Between FD_DD ($\overline{X}$ = 78.47) and BA_AA ($\overline{X}$ = 87.95) in favor of BA_AA; CB ($\overline{X}$ = 79.86) and BA_AA ($\overline{X}$ = 87.95) in favor of BA_AA. According to these findings it may be thought that generally students' attitudes toward making computer supported education are increasing significantly while their computer lesson achievement scores are rising.

7.The findings for the correlation between the students' attitudes toward computer and their attitudes toward making computer supported education

Pearson correlation findings for the correlation between the students' attitudes toward computer and their attitudes toward making computer supported education are given in Table 7.

Table 7
Findings For The Pearson Correlation Between The Students' Attitudes Toward Computer and Their Attitudes Toward Making Computer Supported Education

	1	2
	Students (N=220)	
1. Attitudes toward computer	—	.69
2. Attitudes toward making computer supported education		—

As seen in Table 7, significant and moderate correlation is determined between the students' attitudes toward computer and their attitudes toward making computer supported education, r= .69, $p< .001$.

RESULTS, DISCUSSION and PROPOSALS

In this study it is determined that, gender variable don't affect students' attitudes toward making computer supported education. Same result was found by Berkant and Efendioğlu (2010) on a paper researching classroom students' computer self-efficacy believes and their attitudes toward making computer supported education. Similarly, Efendioğlu and Yelken (2009) didn't find any correlation between this attitude and the gender. Beside, there are studies indicating higher attitudes of female students (Ekici & Berkant, 2007) and higher attitudes of male students (Cassidy and Eachus, 2002; Işıksal and Aşkar, 2003; Miura, 1987).

Berkant and Efendioğlu (2010) determined that computer lesson academic achievement scores didn't affect the same attitudes. The result of our study indicating significantly increase of attitudes of the students toward computer supported education while their scores are rising is not compatible with the result of their study. Our result is expected, because rise of students' computer lesson achievements may positively affect their view points to the computer and its use in education when they become a teacher. Beside, the results of our study indicate that junior students and the students getting high computer lesson academic achievement scores have higher attitudes toward making computer supported education. Same results from a paper written by Berkant and Efendioğlu (2010) support these findings.

Tuncer and Berkant (2010) researched the students' attitudes toward internet and if we accept the computer and internet together in a same dimension, same and different results with our research can be determined. In their study, students' attitudes toward internet is not affected by their genders and class levels. Similarly Kesici, Sahin ve Aktürk (2009) found no significant differences between male and female students' attitudes toward computer. But in present study, significantly higher attitudes of sophomore and male students toward computer are determined in contrast with their results. This result may become as expected when the nature of using computer is accepted as technical. In society generally men do the technical works and this situation causes development of some sex roles for men and women. Because of these roles, the idea of some requirements especially for psychomotor abilities such as fixing the computer would affect the attitudes of the female students toward computer. Parallel to our results, according to Anderson, Lankshear, Timms and Courtney (2008) female students percieve advanced computing subjects as boring and they express low attitudes to computers. Also, Comber, Colley, Hargreaves and Dorn (1997) determined that boys are havier users of computers than girls and their attitudes toward computers are higher.

In a paper prepared by Efendioğlu and Yelken (2010) the students' attitudes toward making computer supported education were measured and most of the students (91.7%) stated that when they become teachers, they will use computers in their lessons. The students who took place as sample in their study probably had high level attitude toward computer. Because it is an expected situation that the students who have high level attitude toward computer most likely have high level attitude toward making computer supported education. The results in our study regarding meaningful and moderate correlation between these two attitude may confirm this expectation.

This study shows the significant correlation of academic achievement with the attitudes toward computer and with the attitudes toward making computer supported education separately. Students are measured in computer lesson examinations by the use of both theorical and practical methods. In practical methods such as measuring via studying with computer, practice abilities affect students' academic achivements. Thus it is expected from the succesful students to have higher attitudes because of theie abilities.

According to the results, following proposals may be put forward: (1) In this study, male students' significant higher attitudes toward computer are determined. For promoting the attitude level of female students, educational activities may be organized by using educational materials and environments attracting female students' interest. (2) According to results, students' attitudes toward computer and making computer supported education increase when their academic achivements rise. In this context, enterprises and regulations for the learning environments in which academic achievements rise may positively affect the attitudes. (3) In another study, qualitative research methods may be used to determine students' attitudes toward computer and toward making computer supported education.

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FOSTERING THE EUROPEAN DIMENSION IN THE *e*LEARNING PROGRAMME CONSORTIA: CATALYSTS FOR THE EMERGENCE OF A EUROPEAN E-LEARNING AREA

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Abstract

This article discusses the emergence of a European E-Learning Area (EELA) as a consequence of three factors observable in the e-learning developments over the past decade. The first factor consists of the carving of a policy sector in e-learning via formal instruments such as the *e*Learning Programme, the Lifelong Learning Programme and an array of other e-learning policy stipulations embedded in larger policy instruments at European level (e.g., Framework Programme). The second factor is represented by the mainstreaming of e-learning activities, both through formal and informal measures across multiple domains. Finally, the proliferation and consolidation of interlinked networks of practice as incubators of e-learning innovation and sharing of expertise act as the third factor in the shaping of EELA. The conceptualization of EELA, is substantiated through an analysis of the European e-learning policy documentation and the findings of a questionnaire distributed to the coordinators of projects under the *e*Learning Programme. In light of the research findings, theoretical and practical implications for EELA as a nascent policy domain are explored and offered as a basis for further debate on this theme.

Keywords: European E-Learning Area, *e*Learning Programme, European Union e-learning policy, European Union educational policy, European dimension in education

1. INTRODUCTION

In recent years, with the gradual consolidation of ICT implementation and expansion in education, research on aspects of e-learning ranging from policy development, quality assessment, effective utilization and implementation strategies to key pedagogical implications has grown and diversified. The present study is situated in the context of a growing body of research literature on comparative perspectives regarding the problems and successes of e-learning policies and strategies undertaken in various national and cross-national settings, with a particular focus on the European Union (Servaes & Heinderyckx, 2002; Boezerooy & Gorissen, 2004; Debande, 2004; PLS Ramboll, 2004; Dittler, Kahler, Kindt & Schwarz, 2005; OECD, 2005; Salajan, 2007a; MacKeogh, 2008; Stansfield & Connolly 2009). This study is a follow-up evaluation of a previous study I conducted on aspects of policy-making and implementation related to the *e*Learning Programme (Salajan, 2007b). The Programme, which was operational between 2004 and 2006, was the European Commission's dedicated policy program to promote and accelerate the integration of ICT primarily in education, and, by extension in the public and private sectors via educational partnerships. It acted as the continuation of the *e*Learning Action Plan, which was operational between 2001 and 2003. Both the Action Plan and the Programme, which were funded from the EU budget, were the operational components of the *e*Learning Initiative, the political declaration that sought to drive the objectives mentioned above (European Commission, 2001; European Union, 2003).

The previous study had revealed a mixed picture as far as the policies and strategies of ICT implementation in various countries of the European Union were concerned. The in-depth interviews with a number of academics and practitioners from three principal EU countries (Germany, Portugal and Sweden) and several other secondary countries pointed to the differences of approaches in the way the policies were promoted at governmental level. The general dissatisfaction with the cumbersome procedures of obtaining European funding for e-learning projects was an issue often reported by respondents. It was also obvious from the responses received that the e-learning efforts throughout Europe were the result of a grassroots movement of academics sharing common professional and pedagogical interests that accounted for the formation of consortia, partnership and collaboration networks in e-learning. With the present study, I am taking a

structured and methodical approach to measuring the perception and experience of the individuals who held the role of project coordinators under the *e*Learning Programme and, with the help of these accounts, highlight the horizons of a nascent European E-Learning Area. The project coordinators had first-hand experience in developing their project proposals, in obtaining the funding from the European Commission and in managing consortia of at least three institutions from as many countries. Thus, it was sensible, pertinent and necessary to probe this knowledge and experience in order to better understand the dynamics of the *e*Learning Programme and its implications for the European e-learning developments.

The research in this study takes in consideration the 152 project retained for funding out of hundreds of proposals received by the Commission throughout the duration of the Programme.

While the exploratory component of this study on the emergence of a European E-Learning Area is at once observational, theoretical and slightly speculative, for the task of establishing the direction of this study, the research questions guiding it were concentrated around the motivations and expectations of project coordinators under the *e*Learning Programme related to their involvement, in this specific role, in pan-European projects. Normally, only one institution from one country was entrusted with the responsibility to coordinate such a consortium. In most cases, one person from the coordinating institution was designated as the project manager or coordinator.

Against this background, what were the circumstances in which they took the decision to participate? What were the factors that led them to that decision? How did they perceive the administrative procedures of obtaining the necessary funding to get the project off the ground and lead it to completion? What were the specific outcomes of their projects and how satisfied were they with the overall performance of the projects? What were the sustainability prospects of the projects beyond the funded period? What were the most and least rewarding aspects of their participation? These are some of the questions posed to project coordinators and the answers they provided reveal both expected and surprising findings.

The following section constructs an understanding and identifies the structural components of the European E-Learning Area as a developing policy entity. Section 3 explains the methodology and design undertaken to address the research questions articulated for this study. A discussion pertaining to the relevance of the study's findings and conclusions are provided in sections 4 and 5, respectively.

2. CONTOURS OF A EUROPEAN E-LEARNING AREA

As an extension of the discourse on European e-learning, the discussion in this section is related to a body of literature dealing with the convergence of European policies in other sectors, such as the European Higher Education Area, the European Research Area, the European Education Space or the Single European Information Space (DeWit, 2003; Corbett, 2005; Amaral et al, 2009; Dale & Robertson, 2009). All of these latter terms may be construed as natural spin-offs deriving from the integration processes originated by their largely economic predecessors embodied in the Single or Common Market and the European Monetary Union.

This study advances the notion and argues for the acknowledgement of an emerging European E-Learning Area (EELA) governed by normative arrangements similar to those arising in the European Higher Education Area and connoting an implicit "Europeanization" of the e-learning realm. I do not mean European by virtue of a shared belonging to a geopolitical and economic space, but because e-learning actions have become increasingly bound by norms, regulations and "ways of doing things" (Radaelli, cited in Alexiadou, 2007, p. 107) that are intrinsically European, in their institutional origination and formulation.

The departing point in my argumentation supporting the conceptualization of EELA is the communication from the European Commission titled *eLearning – Designing Tomorrow's Education*, also known by its mobilizing title of *eLearning Initiative*. I will deal with the gradual building of a legal framework for European e-learning objectives later on. To set the stage for outlining EELA's substance, I contend that, despite the Commission's explicitly stated intent of keeping the *e*Learning Initiative embedded in the larger discourse of European competitiveness and preservation of its social model evoked by the Lisbon agenda (European Commission, 2000, p. 3), ten years down the line, a parallel process is beginning to take shape. While this may have been an unintended consequence of the peculiarities of European policy-making, it is quite possible that it satisfies an unexpressed sentiment in the Commission that eLearning should have

transcended to a European level and take its place in the armamentarium of other policy streams that have acquired a distinct European scope.

Consequently, as I explain below, I take a three-pronged approach to defining EELA and regard it as the incipient development of a consistent policy at the European level in contrast to investigations of e-learning policies designed at national level. Thus, I consider the impalpable and inexorable shaping of EELA a distinctively different phenomenon from actions taken at purely national level, typically presented as a mosaic of somewhat disparate realities of e-learning programs in individual European countries (see, for example, Dittler et al, 2005). I propose that systematic actions at European level have given rise to a new kind of e-learning appropriation beyond the realm of national policies, not necessarily confined to the exclusive domain of education. The intensification of e-learning transactions and interactions in Europe, with the support of initiatives designed by European sponsoring entities (the European Commission, the European Parliament and the Council of the European Union), has provided the breeding ground for a novel embodiment of e-learning permeating multiple sectors that, at first glance, might seem unrelated to one another.

Although the main sector of applicability for e-learning programs, education is not the only domain in which the European e-learning policies find their justification. Just as we conceive of a European Educational Area or European Educational Space (Hingel, 2001; Dale, 2009; Robertson, 2009), we can acknowledge a European E-Learning Area which emerged somewhat unintentionally and independently from the initial objectives embedded in the e-learning actions and initiatives promoted by the European Union. While EELA may appear as elusive a term as the presumed European Educational Area, it is not inappropriate to suggest here that the former subsumes the latter and not the other way around. The provision of e-learning, spurred by the e-learning initiatives at European level, has expanded beyond the boundaries of the traditional educational space, forming networks comprised of industrial organizations, social alliances, civic associations, non-governmental groups and institutions of governance, each utilizing and adapting e-learning solutions for specific purposes. With the assistance of the EU-supported e-learning programmes in their various guises (the *e*Learning Programme, the Lifelong Learning Programme, the recurring IST Programme under the Seventh Framework Programme, etc.) it was only a matter of time until the amplification of the density and intensity of e-learning exchanges within these networks would logically lead to the materialization of EELA.

European e-learning activities have distinct roles, scopes and objectives, as opposed to e-learning activities unfolding at and below the national levels. While national initiatives in e-learning may embrace and promote cooperation between domestic entities and counterparts from European countries, they can only support European engagement in e-learning on a limited basis, sometimes confined by the domestic entities' pre-existing preferences for collaboration with a small number of European partners. This limited approach through national initiatives, while still conducive to a small-scale Europeanization of e-learning within those collaborative partnerships, may sometimes impede the genuine transfer of e-learning expertise to potentially interested beneficiaries of e-learning products, services and ideas in the wider European arena. Addressing this larger scope certainly requires a broad vision and approach to e-learning from European perspective. Thus, formalized and established European e-learning policies create a distinctively unique appropriation of e-learning activities not solely for the enhancement of ICT-supported actions, but also to consolidate the "European dimension" so often cited in EU institutional discourse. We are not simply talking about the presence of isolated and insulated efforts in e-learning at national levels, but deliberate and specifically directed activities that have as an end result the construction of an area of e-learning that purposefully assumes a European-centered approach with the express intent of conferring a European identity to e-learning-related actions.

To scholars and students of European integration in education, the features of EELA will look somewhat familiar. As an ideational tool and a guiding construct for the amalgamation of the e-learning transformative policy directions in Europe, it is a useful exercise to conceive of EELA as resting on three pillars:

1. ***Formal legislation*** for the deployment and administrative oversight of e-learning objectives at European level;
2. ***Mainstreamed e-learning activities*** through *de jure* measures and *de facto* pressures across multiple sectors deriving benefits from these activities;

3. ***Interlinked networks of practice*** serving European e-learning actors in their pursuit of promoting the acquisition of ICT-related skills, regardless of domain.

3. AN EMPIRICAL EXPLORATION OF EELA

Having sketched out the theoretical foundation of EELA, we need to provide empirical evidence that substantiates its conceptualization. For this purpose, I am using the results of an online questionnaire which was distributed to the designated lead coordinators of projects under the *e*Learning Programme (from this point forward abbreviated as ELP). The choice of ELP for the purpose of this investigation is justified by the fact that, at the time of this research (2008-2009), it had been the only dedicated policy instrument for e-learning designed specifically at European level. Moreover, it provided the largest number of completed projects at the time, with some projects from the last calls for proposals launched in 2006 entering their very final stages of operation. The Lifelong Learning Programme, which acquired jurisdiction for e-learning-related actions, is only now reaching its mid-point of operation. Therefore, a comprehensive assessment of all the e-learning projects unfolding under it will only be possible once it nears completion in 2013.

3.1 Selection of participants

The participants in the study were contacted through the email addresses publicly available on the European Commission's ELP website. While in isolated cases the project coordinators were either unreachable because their email addresses had lapsed or because they ceased involvement in the projects at an early stage, the overwhelming majority of the project coordinators were contacted successfully. In cases in which the original contact information was outdated, alternate email addresses were either requested from coordinators' colleagues listed on the individual projects' websites or obtained from the organizations with which the coordinators had been affiliated. The first call for participation in the study was sent in April 2008 to former and, at the time of survey distribution, current project coordinators. Data collection was completed in May 2009.

3.2 Survey instrument design

The 22 items included in the questionnaire contained a mix of multiple-answer, Likert rating scale and essay questions. Apart from the pre-determined answer choices included, each questionnaire item had an added comments field which allowed the respondents to elaborate or offer further details to their selected answer.

The questionnaire was divided into five sections, depending on the type of information solicited through the questions. Thus, the first section collected general information about the project. The second section focused on the administrative aspects of the project experience. The questions in the fourth section inquired about the outcomes of the project. In the fourth section, the coordinators' satisfaction with the project was probed. Finally, the fifth section contained an open field meant to collect any additional comments related to the project from the participants in the study.

Once the questions were developed, they were pre-tested on a small sample of subjects from European institutions participating in the ELP to ensure relevance, comprehension and accuracy of the measurement items. The rating scales in the final version of the questionnaire were checked for construction reliability and validity with the *Survey Quality Prediction* tool (http://www.sqp.nl/) developed by Saris, Gallhofer and van der Veld (Saris and Gallhofer, 2007). Validity, reliability and quality levels were satisfactory, with coefficients for the rating scales ranging between .968-.975, .779-.829 and .756-.807, respectively.

3.3 Survey response items validation

Before the actual research analysis could be completed, the rating scale items on the questionnaire were tested post-data collection for internal consistency reliability, using Cronbach's alpha reliability coefficient. The alpha reliability value of .766 obtained indicated that the data collected via the rating scales show satisfactory reliability, in excess of the .70 level routinely considered adequate for survey instrument items (DeVellis, 1991).

In addition, item non-response bias was considered to pose a problem for the validity of the results, given the choice of some respondents to leave certain items unanswered. However, the non-response proportion per each rating scale was below the 5% threshold normally accepted in survey research (Silvey 1975, Fowler 2009), rendering item non-response bias negligible in the totality of the data collected. An exception to this rule can be made in the case of one question, which probed the opinion of the project coordinators on the logistical support they received from their national governments. Given the particularities of certain projects, a number of respondents provided textual responses only, specifying that, in their projects' cases, governmental support was either unnecessary or was not solicited. Thus, the resulting number of responses to that question was sensibly lower and item non-response was higher than the 5% threshold.

3.4 Geographic and thematic distribution

A total of 113 individual responses were received, representing 126 separate projects under the ELP in the paper. The cause of this imbalance between the individual responses and the actual number of projects covered by the responses rests in the fact that some respondents coordinated more than just one project. In one instance, because of a shared experience with their individual projects, several coordinators delegated one person to complete the questionnaire on behalf of all the projects. Consequently, the 126 projects covered in this study correspond to a response rate of 82.9% of the total of 152 projects selected by the Commission for funding under the ELP between 2001 and 2006.

Perhaps not surprisingly, the regional distribution of the coordinating institutions in this study's sample revealed that the larger member states of the European Union have been more active than the smaller member states. The data representing the countries that coordinated ten or more projects indicated that Italy (17.5%) was the country with the largest proportion of coordinating institutions, followed by Germany (14.3%), France (11.9%), Spain (11.1%), United Kingdom (9.5%) and Belgium (8.7%). Coordinating institutions from these six countries combined represent 73% of the entire sample of 126 projects included in this study. This situation is a confirmation of an earlier study conducted on behalf of the European Commission by the Time Center of the Grenoble School of Management. The Grenoble study is used here as a measure of intermediary comparison with the results of the present study on the timeline of the ELP. Covering 60 projects from the 2001-2003 period of the *e*Learning Action Plan (the predecessor of the ELP), the Grenoble study showed that the same six large member states accounted for 83.3% of the total number of coordinating institutions in e-learning projects: France and Italy (21.6% each), Germany (13.3%), Belgium (10%), and Spain and United Kingdom (8.3% each) (Grenoble, 2008, p. 27). Even though the ranking order is different in these two instances, it is clear that institutions from these six member states claimed a larger involvement from the early stages of the ELP and maintained this dominant stance throughout its duration. Consequently, they attracted more European funding than institutions in smaller member states.

While only coordinating institutions were considered in this study, if we take into account the total number of participating institutions in the ELP, it is evident that the state of affairs is somewhat similar. From the 729 partner institutions involved in the projects represented in this study's sample, 401 or 55% of the partners hailed from the six member states, out of a total of 37 countries participating in the ELP (Figure 2). Taking the Grenoble study once again as a temporal point of comparison, a similar picture emerges. Thus, the proportional distribution per country of origin of the 477 participating institutions in the Grenoble study was the following: France (13.8%), UK (14%), Italy (12.4%), Germany (9.9%), Spain (9%) and Belgium (8.2%) or a combined 67.3% for these six countries out of the total number of participants counted in that study. The favorable differential for the Grenoble study as compared to the present study is attributable to the simple observation that, by the end of the ELP, existing and additional countries, including member states from the 2004 wave of enlargement, had taken on more coordination responsibilities, thus diluting the proportion of the six countries in the overall sample.

When it comes to the themes under which the projects were categorized, these are well distributed across the themes and funding years of the ELP. Thus, *Digital Literacy*, with 20 projects (15.9%), is the theme with the largest number of projects represented in the sample. Remarkably, all the projects in the *First Phase* theme, that is 10 out of 10, representing the highest proportion of projects under any theme, are included in the sample. The *Media Literacy* and *Virtual Campuses* themes closely follow *Digital Literacy*, each with 19 projects (15.1%) of the study sample. In terms of the absolute number of projects selected in one year, 2003 was the most prolific in this sample, with 35 (79.5%) of the initial 44 projects selected that year. Proportionately speaking, however, 2006 had a larger share of projects represented in the sample, with 18 (94.7%) of that year's 19 projects.

One new development that stands out in this study, in comparison with the Grenoble study, is the presence of three member states from the last two rounds of EU enlargement. Bulgaria, Czech Republic and Poland each figure with one institution in the role of project coordination, although Bulgaria had not been a member state at the time the last call for proposals was issued. We also note that two countries outside the EU are represented in the sample: Norway, with 2 projects and Switzerland, with 1 project. Having provided a synopsis of the basic data about the projects studied, the following section provides an analytical view of the responses supplied by the participants in the study.

4. IMPLICATIONS FOR EELA

The results indicate that the coordinators were considerably disappointed or frustrated with the administrative criteria and procedures that have to be followed in order to obtain the funding necessary for the initiation and completion of their projects. Indeed, they cited bureaucratic requirements, administrative overhead and the limited duration of funding for their projects as the least rewarding aspects of their participation in the project. Despite these apparent shortcomings, it is not surprising that project coordinators placed a higher value on the support received from the European Commission, in comparison with that received from their home institutions or particularly from their national governments. It is plausible to claim here that having a vested interest in the success of the ELP, the Commission would only naturally seek to provide support to the largest extent possible to the coordinators (and, by extension, to the project participants) of the projects that the Commission itself selected for funding.

The close rating that the home institutions received from coordinators on that same aspect can be attributable to the following factors: the favorable financial implications deriving from the acceptance of a project for European funding; a genuine interest in collaboration in e-learning at European level; raising the reputation of the home institution among its European counterparts; and the possibility of continuing e-learning partnerships. The low expectations regarding governmental support should come as no surprise, since, being administered through European agencies, the projects do not normally require the national governments' involvement. Where such involvement exists, this may be usually limited to governmental agencies that provide training and advice on how to effectively apply for European funding, but these services may not always be available or known in all cases.

Even though the financial component of the projects seems to be an important catalyst in the drafting of project proposals, it is somewhat surprising that this aspect is not the lead factor that drives the e-learning practitioners to take on the mantle of project coordinators. They are rather motivated more by professional reasons than financial considerations. As we have seen, the possibility of attracting European funding was only the fourth most important factor that determined the respondents to assume the coordination responsibilities for their individual projects. In turn, they gave more attention to the opportunities to develop and disseminate information on e-learning best practices as well as to the prospect of working on new e-learning initiatives. This speaks volumes to the dedication that e-learning professionals, such as the respondents in this study, show for the advancement of ICT in European education. Further proof of this enthusiasm for e-learning presents itself in the level of collaboration that the coordinators thought characterized their projects. It is clear from the responses collected that the consortia of partner institutions in the ELP were highly productive environments which yielded positive outcomes. It is, perhaps, partly due to this spirit of dedication that most coordinators considered their projects sustainable beyond the completion date under the ELP, even though this also meant that funding from this source would cease. However, the formation of partnerships, the experience accumulated during the Programme, the professional networks

developed and the research dissemination resulting from the projects seem to create favorable prospects for the projects to continue, by attracting funding from other sources.

While the coordinators in this study had relatively modest impressions regarding the impact of their projects within their home institutions and in their national contexts, it is evident from the study's findings that they were highly satisfied with the outcomes of their projects. As a direct consequence of this experience, in what could be considered a "passing mark" for the ELP as the framework within which the projects yielded their results, the vast majority of the coordinators indicated that they would participate in future e-learning projects benefiting from European funding. Essentially, a combination of positive collaboration, satisfactory outcomes and the fulfillment of professional interests outweigh the more tedious and cumbersome aspects of project coordination.

Having synthesized the more observable patterns in the data resulting from the coordinators' responses, it is now necessary to briefly reflect on how these measured perspectives inform the crystallization of EELA. First, the pan-European consortia formed by the coordinators and their institutions provided a conduit for the exchange of practices and innovation resulting in mutually beneficial products or services that may have not been possible in the absence of the express support of a dedicated policy program at Community level. Second, the convergence of participants in a European e-learning venue enriched the participants' own experiences and provided a platform for their further professional development. Third, the collaborative work fostered by the consortia, in many cases, contributed to the promotion of e-learning results in the coordinators' home institutions or countries and, by extension, to the initiation or consolidation of e-learning processes in those jurisdictions. Finally, it is indubitable that the network connections, both institutional and individual, cultivated during the consortia partnerships have had the most lasting effects that are likely to fuel future e-learning developments at European level.

Pulling these four threads together, we notice that they correspond to the features of EELA. However relevant and supportive the data of this study are of the conceptual model of EELA, we cannot venture too far in stating that ELP has fundamentally revolutionized the e-learning landscape in Europe. These are the early stages of a policy-driven common area of e-learning for Europe and the Community is still cautiously treading the delicate balance between the levers of decision-making assigned at Community and member state levels in this realm. Nevertheless, the relevance of EELA as a policy domain cannot be understated. Its recognition would allow for the prioritization of e-learning measures at European level so that e-learning policy initiatives can be made compatible, both horizontally (among Member States) and vertically (between Member States and the Community). As a more important practical aspect, the formal support and long-term commitment of the Community for EELA could ensure that funding for e-learning actions is assigned a precise proportion in each EU budgetary cycle. In terms of application and enforcement, a formally agreed-upon EELA would not entail the drafting of new rules for quality assurance, accountability and progress tracking. Instead, it could adopt and adapt the benchmarking procedures employed in the Bologna process, via the open method of coordination now customary in dealing with policy formulation, implementation and monitoring in the European Higher Education Area.

5. CONCLUSION

The ELP has opened and fostered a space of collaboration in European e-learning that has contributed to development of a sharing of expertise and knowledge throughout networks of e-learning professionals. While the full impact of the Programme is difficult to quantify to the fullest extent, the kaleidoscope of perceptions offered by project coordinators converge to a common point of assessment for European e-learning in this particular case: the final products of collaboration are worth pursuing in the face of laborious and demanding criteria for European funding.

Whether the ELP, by itself, has contributed to a pervasive integration of ICT in education and society is an open question. What can be surmised from this study is that ELP has provided viable models of e-learning practices that can be replicated in various parts of Europe, which have not yet benefited from the collaborative networks formed through the Programme. It can only be hoped that the wealth of expertise and knowledge generated through these projects will continue to spread through other European programmes. With the inclusion of some of the ELP's objectives and outcomes into more comprehensive programmes, such as the Lifelong Learning Programme, there is increased potential for e-learning to broaden its reach

through multiple layers at the intersection of education and society in Europe. In doing so, the seeds sown by the Community in the early stages of e-learning policy formulation at European level are bound to gradually grow into a genuine and established space for e-learning on which Europe can rely in its quest for innovation in the service of socially responsible competitiveness.

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FRACTIONS AND OPERATION WITH FRACTIONS, USING OF INTERACTIVE TABLE

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Abstract: In this paper we will consider the advantages about using the interactive table in the mathematics class during the educational process. Students are in the center of each process of education, so we look for a different methods to make easier, simplest and fast approve of the knowledge. Using this interactive table in the education, we have a lot of positive affects because with it the work of the teachers gets easier, the students learn new knowledge simply, and most important of all we receive great attention. In this paper we will regard organization on mats classes, for approve new contain – fractions and operation with fractions.

Keywords: Fraction, interactive table

Introduction

When we are talking about an education actually we means a process which is affected from the social life. We can say that with better quality of life and advancement of the technology the education is development too. All news in technology affects on a society and with better social life we have a better educational process. With using on technology invention education became successful, more interesting and is easier for understand from the children. In the center of focus in each educational process is a child, so we are looking different ways to make the education easier process. We can say that with using a interactive white table in the education, the education became easier, the teachers work is more easier than before, and the most important thing is that we can easy keep the children's attention. The traditional process of organization of class usually can be monotony for the children. With using a interactive white table, the class became more interesting, because the children are included in the process of organization. As well as the children successfully absorb the new knowledge and achieve better result.

Interactive white table

The **SMART Board interactive whiteboard** is a product of SMART Technologies. It is a large, touch-controlled screen that works with a projector and a computer. The projector puts the computer's desktop image onto the interactive whiteboard, which acts as both a monitor and an input device.

The first SMART interactive white table is produced in 1991. It was sample but has some of the same function as the modern interactive white table. It was the first interactive table which accomplish control with touch (contact) on computers applications and annotation on standard Microsoft Windows applications.

An interactive whiteboard is a large interactive display that connects to a computer and projector. A projector projects the computer's desktop onto the board's surface, where users control the computer using a pen, finger or other device. The board is typically mounted to a wall or on a floor stand. They are used in a variety of settings such as in classrooms at all levels of education, in corporate board rooms and work groups, in training rooms for professional sports coaching, broadcasting studios and more.

Interactive whiteboards are used in many schools as replacements for traditional whiteboards or flipcharts or video/media systems such as a DVD player and TV combination. In addition, some interactive

whiteboards allow teachers to record their instruction as digital video files and post the material for review by students at a later time. This can be a very effective instructional strategy for students who benefit from repetition, who need to see the material presented again, for students who are absent from school, for struggling learners, and for review for examinations.

In most cases, the touch surface must be initially calibrated with the display image. This process involves displaying a sequence of dots or crosses on the touch surface and having the user select these dots either with a stylus or their finger. This process is called alignment, calibration, or orientation. Fixed installations with projectors and boards bolted to roof and wall greatly reduce or eliminate the need to calibrate. A few interactive whiteboards can automatically detect projected images during a different type of calibration.

A variety of accessories is available for interactive whiteboards:

- Projector — Allows a computer display to be projected onto the whiteboard. 'Short Throw' projectors are available from some manufacturers that mount directly above the board minimizing shadow effects. 'Ultra Short Throw' projectors are even more effective.
- Track — Allows the whiteboard to be placed over a traditional whiteboard or tackboard to provide additional wall space at the front of the room. Some tracks provide power and data to the whiteboard as well.
- Mobile stand — Allows the interactive whiteboard to be moved between rooms. Many are height adjustable as well.
- Printer — Allows copies of the whiteboard notes to be made.
- Slate or tablet — Allows students control of the whiteboard away from the front of the room.
- Personal Response System — Allows students to answer test questions posted on the whiteboard or take part in polls and surveys.
- Wireless unit — Allows the interactive whiteboard to operate without wires to the computer, e.g. Bluetooth.
- Remote control — Allows the presenter to control the board from different parts of the room and eliminates on-screen toolbars.

The SMART Board software bundle comprises Notebook white boarding software and SMART Board Tools. Versions are available for Windows, Mac, Linux, Solaris and SGI (Irix) operating systems.

SMART Board Tools are the start centre, spotlight, screen shade, magnifier, floating tools, on-screen keyboard, LinQ software, video player and recorder. And the notebook is also good for teaching and printing.

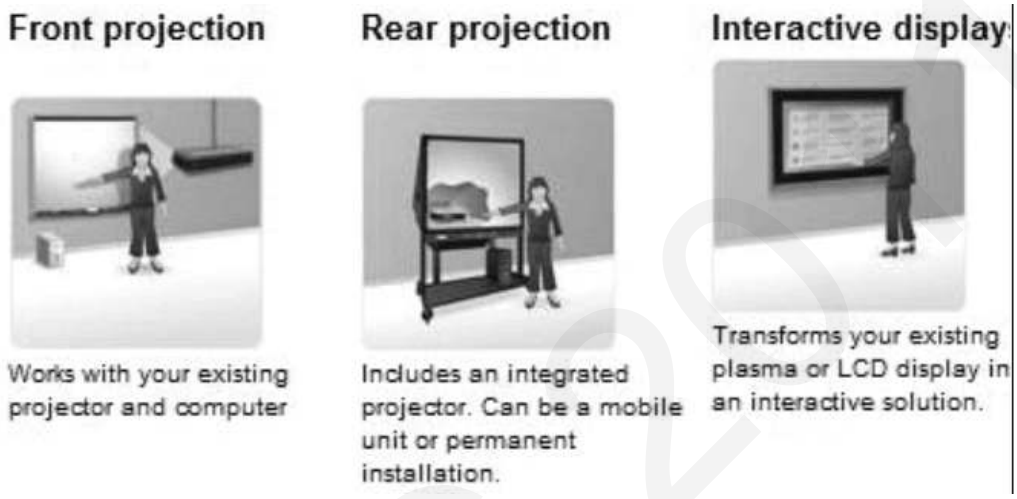
The SMART Board interactive whiteboard works with any program loaded or available on the host computer. Some applications commonly used with the SMART Board interactive whiteboard are Microsoft PowerPoint, Excel and Word, and AutoCAD. Uses for the SMART Board interactive whiteboard include teaching [4], training, conducting meetings, and delivering presentations.

Interactive whiteboards are generally available in two forms: front projection and rear projection.

- Front-projection interactive whiteboards have a video projector in front of the whiteboard. The only disadvantage to these boards is that the presenter must stand in front of the screen and their body will cast a shadow. Presenters quickly learn to compensate for the shadow by slightly extending their arm with or without a stylus. This disadvantage is mitigated when using an Ultra-Short-Throw (UST) projector, which casts its beam from above and just in front of the IWB surface, removing the presenter from the beam's path.

- Rear-projection interactive whiteboards locate the projector or emmisive display behind the whiteboard sensing surface so that no shadows occur. Rear-projection boards are also advantageous because the presenter does not have to look into the projector light while speaking to the audience. The disadvantages of these systems are that they are generally more expensive than front-projection boards, are often very large, and cannot be mounted flush on a wall; however, in-wall installations are possible.

Some manufacturers also provide an option to raise and lower the display to accommodate users of different heights.



1. Interactive whiteboards with front projection and rear projection.

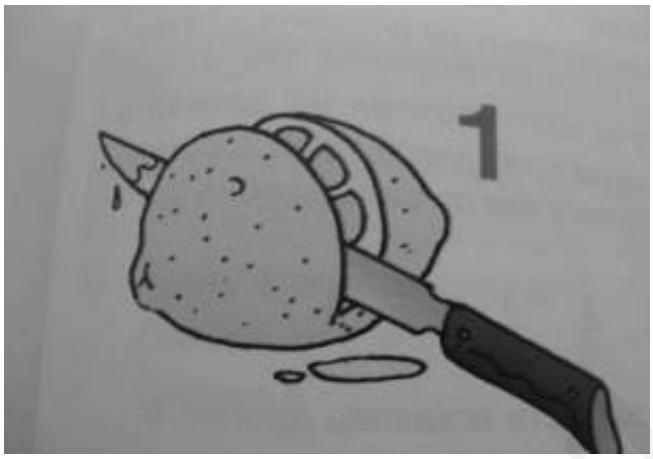
Short-Throw Projection Systems and Interactive Whiteboards

Some manufacturers offer short-throw projection systems in which a projector with a special wide angle lens is mounted much closer to the interactive whiteboard surface and projects down at an angle of around 45 degrees. These vastly reduce the shadow effects of traditional front-projection systems and eliminate any chance for a user to see the projector beam. The risk of projector theft, which is problematic for some school districts, is reduced by integrating the projector with the interactive whiteboard.

Use the interactive white table in the mathematics class

We will explain how the interactive table can be used for easier and more clearly understanding on concept of fraction. To keep the children attention we start the class with one simple example. \

Example 1: One lemon is separated of two peer parts. We gain two half. When again we combine two half we gain one whole.



2. Lemon separate on two parts

Example 2. One square is separated of four peer parts. We can colour these parts in different color. For example we show a quadrat which is separate on fort part and tree of them are in black color. The parts with black color show the salient parts and the number four is showing how many parts have the all object.

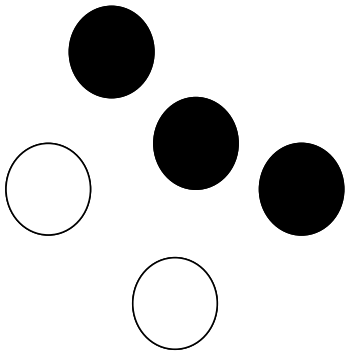
3. square separated on four parts

After, we show them some others examples of object which are separated differently on more parts.

We should include the children in the educations process, with exercise which they should done. We show different fraction to the children and they should separated objects with the correctly part, and color the necessary parts.

We explain to the children, that any fraction is containing from denominator and numerator. On which parts is separate fraction is shown by denominator, and how many parts are taken from them is shown by numerator.

|We show them set with 5 elements, from which 3 are in black color and 2 are white. We explain that with black elements from the set, we shown the fraction 3/5. After that, we give on the children exercise with sets and they should write the true fraction behind them.

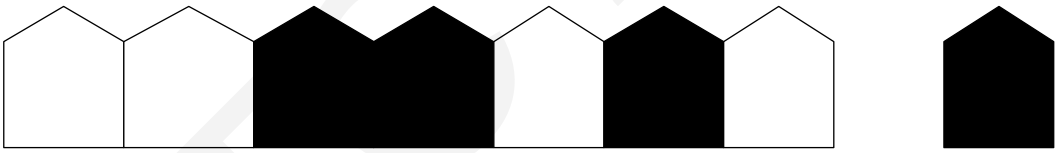


4. set with 5 elements

We explain them that the fraction can be used in practical exercise. We give example with dividing, as the example when the number 8 is separated in 2 parts (at the same time, we show this and on interaction table). We give example, how many is 1/3 from the number 6, and children solution similar example alone. From this we conclude that the children have understood the concept of fraction.

On following example, we show one object which is contain from 6 parts, 3 parts are in white color and 3 in black color. The children should color object on other way, but whit same colors and 3 part with black and 3 with white. From this exercise, they should to understand that is not important where the part is based, but is important to still 3 parts, and that the fraction is 3/6.

With following example, we regard fence which is color in different color. We ask children how many parts from fence are color black and how many white.



5. fence which is color in different colors

We explain to the children, that we can do operation with fraction, ass addition and subtraction. We show some examples with addition, as 1/4+1/4. We explain them, that we should to add 1 and 1, and result is 2. Because denominator is equal for the two fractions, the result of addition is 2/4. After this, the children do addition with fraction themselves. Also, we show some examples with subtraction on fraction. For example, we explain, which fraction will be gain if from the fraction 3/4 is subtraction the fraction 1/4. We explain that we should to calculate 3 – 1 = 2. And because the denominator is equal for the two fractions, the result is 2/4. After, the children do subtraction with fraction themselves. \

Conclusion

When we use the news of the technology we make the education process closer, more interesting and easier for understanding.

If we want to have an interesting and successful class we should use interactive white board and the results are infallible. They have positive impact on the children attention and to increase the children motivation.

We use interactive white board in elementary school for replacing the traditional table, audio and visual aids.

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FROM COMPUTER LITERACY TO COMPUTERS FOR COMMUNICATION COURSE

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ABSTRACT

Undoubtedly, at the outset of the new millennium, technology has an incredible impact on our lives. Particularly, its influence on communication technologies has been changing the communication patterns. Parallel to the other fields, these changes influence education. In education, the discussion of whether to teach through computers or not let its place to a situation where technology is integrated in everyday teaching activities and the issue has been replaced by the extent to which teaching involves Computer Mediated Communication. This fast spread of technology has led to alterations of curricula and the contents of the courses that have been intended to guide tertiary students towards being computer literate.

The present paper sets to compare the efficiency of Computer Literacy course provided at the Eastern Mediterranean University's Faculty of Communication and Media Studies with the Computers for Communication course which replaced Computer Literacy course almost after a decade. The questionnaire prepared and administered in 2002-2003 academic year is applied to 30 students who took the Computers for Communication course in the 2010-2011 Academic year fall term and results are compared.

Key words: computer literacy, Computer Mediated Communications, Communication and media education

The end of the 20th century has observed a smooth but fast transition from traditional literacy to computer literacy (Gümüş & Akter, 2002). Similar to other disciplines, developments in technology has had an immense impact on education. Indeed, Sherblom (2010) points out to Thompson (2008) who suggests that: "There is a 'prevalence of computer-mediated communication (CMC) in education". From this change, particularly Computer Literacy courses have been affected since the students that come year after year are better equipped with technology. Rainie (2006) asserts that "Today's young adults have grown up in an environment rich with digital communication technologies". The expedited spreads of communication technologies necessitate constant changes in the curricula of the courses, particularly the ones that are targeting to improve computer literacy of the students.

The present study sets out to compare the computer literacy skills of students who study at the Faculty of Communication and Media Studies of the Eastern Mediterranean University over almost a decade. After almost a decade, one of the two computer courses (Computer Literacy and Computer Mediated Communication) is removed from the curriculum and replaced by a single course named as Computers for

Communication. The initial study was conducted as pre-test – post-test application. The findings of the first research were presented in IETC 2003.

The word 'literacy' is rather problematic. Despite the fact that literacy, initially, meant ability to read and write, parallel to technological developments, terms like computer literacy, technological literacy, information and digital literacy started to emerge. These terms may emphasize different aspects of technology; however, they can also be used synonymously. In other words, in addition to its original meaning of possessing the basic skills of reading and writing in the mother tongue, the term 'literacy' has taken over a variety of meanings over the time. Currently, a contemporary person needs multiple literacies and among these, 'digital literacy' occupies a significant place in our lives (Goodfellow, 2011).

Computer Literacy

Computer literacy is not a static term. It takes up a variety of meanings as the developments take place and change from one context to another. According to Dictionary of Media Studies (2009:48) it is defined as: "Understanding of basic principles of computers, related expressions and concepts, and the ability to use computers for programming or applications". Indeed, another definition of computer literacy suggests that it covers the:

> knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving. Computer literacy can also refer to the comfort level someone has with using computer programs and other applications that are associated with computers. Another valuable component of computer literacy is knowing how computers work and operate. … The precise definition of computer literacy can vary from group to group (http://en.wikipedia.org/wiki/Computer_liteacy).

In the continuation of the above quotation, computer skills are divided into 3 categories as basic, intermediate, and advanced. Basic skills include items like switching on the computer, ability to use mouse in order to interact with the monitor and ability to use the computer keyboard. Intermediate skills cover: word processing, using e-mail, spreadsheets, databases, the Internet, installing software and operating systems. Advanced skills comprise programming, using computers for research, ability to fix software conflicts and computer hardware (http://en.wikipedia.org/wiki/Computer_liteacy).

In higher education contexts, the expectations from computer literacy changes with the skills of the newcomer students. The present study focus on the intermediate computer literacy skills of the tertiary students studying at the Faculty of Communication and Media Studies in the Eastern Mediterranean University in 2002-2003 and 2010-2011 Academic years.

Computer Mediated Communication

Computer-mediated communication (CMC) is:

> as any communicative transaction that occurs through the use of two or more networked computers. While the term has traditionally referred to those communications that occur via computer-mediated formats (e.g., instant messages, e-mails, chat rooms), it has also been applied to other forms of text-based interaction such as text messaging.[2] Research on CMC focuses largely on the social effects of different computer-supported communication technologies. Many recent studies involve Internet-based social networking supported by social software (Wikipedia).

The outset of the new millennium has observed expedited spread of Computer Mediated Communication in education (Sherblom, 2010; Thompson, 2008; Truman and Schrodt, 2005). This is not merely so in higher education. Boster et. al (2006:46) draw our attention to the fact that Computer Mediated Communication "is changing the landscape of elementary, secondary, and college classrooms". Despite its widespread use, they further point out that there is "a dearth of strong evidence that it enhances educational performance".

Sherblom (2010: 497) maintains that Computer Mediated Communication classroom instructor can developed positive classroom interaction, relationships and learning experiences. Sherlblom (2010) summarizes the theoretical perspectives of the classroom CMC as:

- The medium and media richness
- Social presence
- Interaction through Social Information Processing
- Identity and deindividuation
- Hyperpersonal relationships
- Critique and Context.

Hrastinki and Keller (2007:62) review recent research (between 2000-2004) on Computer Mediated Communication in education. They suggest that although this is a relatively new research area, literature is growing and it mostly gives what they call 'anecdotal advice'.

Hoag et. al. (2003), review the literature on the use of computers in journalism and media education. They classify the literature into four areas as: computer use in course design, student attributes in a digital learning context, the role of digital information in student learning outcomes and role of faculty attributes. Indeed, they (2003:401) point out that: "Increased computer use has a positive effect on perceived computer self-confidence as well as on computer related articles". In relation to student success in computer-driven classes they conclude that some studies suggest that there is a significant correlation between students' performance and past experiences.

In relation to the use of Computer Mediated Communication in Communication studies, Lane and Shelton (2001:241) asserts that "The Communication discipline's current CMC pedagogy is typical of higher education's outlook toward CMC and all information technologies". They further maintain that:

> The communication discipline can neither turn away from any mode of communication, nor can it practice an educational philosophy that is not grounded in practical use and access issues as well as creative evaluative issues. *Communication* is obviously an inherent part of computer-mediated-communication. In fact, there is a centrality to the role of communication in CMC" (p.242).

Research Methodology

The present study has been designed as a comparative study of students' attitudes towards the computer courses provided by the Faculty of Communication and Media Studies at the Eastern Mediterranean University in North Cyprus. In 2002-2003 academic year, there were two computer courses: one was Computer Literacy and the other was Computer Mediated Communication. In 2010-2011 academic year, on the other hand, merely Computers for Communication course is provided. In the present study, the comparison is made with respect to academic use of computers such as: Email, word processing, searching through the Internet, belief in the Internet content, making web pages, and preparing power point slides.

As it has been mentioned earlier, the study comprises two parts: for the first part of the study data was collected by giving a questionnaire to the 184 freshmen students studying at the Faculty of Communication and Media Studies, at the Eastern Mediterranean University at the end of the Fall semester of the 2002-2003 Academic year. The questionnaire sought to explore their skills in relation to the six points (E-mail, word processing, searching through the Internet, belief in the Internet content, making web pages, and preparing power point slides) mentioned above. Almost a decade later, in the second part of the study the same questionnaire was given to the 32 freshmen students of the same Faculty at the end of Fall semester in 2010-2011 academic year. The comparison is made with respect to the percentages of the responses to the questionnaire.

Analysis and Findings

In the 2002-2003 academic year out of 184 students who replied the questionnaire 101 were male and 83 were female whereas in the 2010-2011academic year, out of 32 students 18 were male and 14 were female.

For the first part of the study, the analysis of the data shows that 53% of the respondents feel very good about using the e-mail. 26% feel satisfactory and 16% feel not very good about using the computers. 5% said that they had no skills in that area. In the second part of the study, after eight years, the percentage of using e-mail good or very good was 80% and the percentage of feeling satisfactory was 16%. Only 3.2% of the respondents said that they are not very good in using e-mail. None of the respondent mentioned that they have no skills in using the e-mail.

In the first part of the study, 26% of the students' mention that they feel good or very good about the use of word processing. 39% mentioned that they felt satisfactory, 29% said that they did not feel very good and 4% mentioned that they had no skills in the area. After eight years, the students who responded to the same questionnaire mentioned that 49% are good or very good in using the word processing, 29% of the students felt satisfactory and 25.8 % said that they did not feel very good in using word processing. No students noted that they have no skills in using the word processing.

In the first part of the study, almost half of the respondents mentioned that they felt good or very good about searching through the Internet. 37% mentioned that they felt satisfactory about their use of the Internet. 15% felt they were not very good, 2% said that they had no skills at all. 3% did not answer this question. At the second part of the study 64.5% of the respondents said that they are good or very good in searching through the Internet and 35.5% felt satisfactory. None of the respondents mentioned that they are either not very good or have no skills in searching through the Internet.

In the first part of the study, 44% of the students were disagreed and 27% of the students were strongly disagreed but only 19% of the respondents were agreed in believing the materials they found from the Internet. at the second part of the study, 38.7% of the respondents mentioned that they were strongly agreed, 45.2 said that they were agreed and only 3.2% were completely disagreed with believing in the materials they were found from the Internet.

Initially, 12% of the freshman students mentioned that they were good or very good at making web pages. 18% felt satisfactory and 30% felt that they were not very good at, and almost 38% mentioned that they had no skills in preparing web pages. 3% did not answer this question. After eight years, 9.7% were good or very good at making web pages, 9.7% felt satisfactory, 25.8% mentioned that were not very good in making web pages and 54.8% said that they have no skills in this area.

In the first part of the study, 23% of the respondents mentioned that they felt good or very good about preparing power point materials. 28% felt satisfactory 26% felt not very good, 22% had no skills and 2% did not answer. In the second part of the study, 51.6% of the students said that they were good or very good, 35.5% felt satisfactory and 12.9% said that they were not very good in preparing power point slides.

Conclusion

The comparison made between the percentages of the responses given to the same issues in 2002-2003 and 2010-2011 academic years indicate that the use of the Internet increased and the Internet established itself as the main source of reliable information. However, tertiary students use the Internet more as consumers rather than producers.

In the conclusion of Gümüş & Özad (2003: 237), it was pointed out that: "Students living in the 21st century must be information literate. This means that, they must have the ability to access, evaluate and use information". The results of the present study indicate that current students are more information literate than the previous ones.

There has not been a significant increase in the ability to make web-pages. Indeed, Dippold (2009:31) warns us against the fact that one's familiarity with the technology does not necessarily mean that students posses the skills to use these tools in educational contexts,

It is also observed that students studying in 2010-2011 use and feel good about using power point more than previous students. This indicates that Computer Mediated Communication has entered primary and secondary education and tertiary students are familiar with power point from their previous education experience.

The results of the study suggest that although the computer literacy skills of the current students better developed, these developments are mostly in the areas where social communication is involved rather than academic skills. Goodfellow (2011: 131) points out that "persistent popular perception of literacy as a singular ability and individual attribute that confers social 'normality' on its owner." Hence stating the social aspect of traditional literacy Goodfellow (2011: 132) asserts the significance of what he calls, digital literacy in higher education as:

> Digital literacy/literacies are transformational for higher education, and relate this enquiry to the view that one of the key benefits that the academy delivers to the society in general is the promotion of practices that are 'critical' whatever the medium of communication.

In a nutshell the result of the study conforms to the literature and emphasizes the social aspect of computer literacy. The significance of the issue is also maintained by Hoag et.al. They assert that:

> "Computers have transformed both the educational environment for communication students and the professions they seek to enter" (2003:407).

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GENDERFACTOR IN THE USE OF INTERACTIVE INTERNET-BASED APPLICATION FOR PROCESS WRITING IN EFL CONTEXT

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Abstract: This quasi experimental research was undertaken to explore the effects of gender on the use of an online internet-based application for process-oriented writing instruction in an EFL (English as a foreign language) setting. The study also aimed to discover male and female students' attitudes towards the integration of forum-based application into the traditional classroom learning environment. To this end, an interactive website, a forum-based blog Mywritingportfolio.net was constructed for English Prep students to use for writing course. The participants were 227 university students (Male =121, Female=106) attending the English prep program. Following a semester of use of the internet-based system for the writing course, a questionnaire was developed to see its use by both male and female students. The results provided encouragement for the integration of internet-based application into the traditional language teaching instruction.

Background

In spite of all our efforts to engage the students in the writing process as part of the syllabus of our University English Prep School, writing does not seem to receive much welcome from the students. Each year about 1900 students are enrolled in our school for a year of intensive compulsory English study prior to their subjects in their respective departments. The students are required to take certain courses in English in their major subject and produce papers in English. When it comes to the picture on the ground, over the last three years the outlook has not been very bright. The challenges have led to a pessimistic mood about the future of the writing course in our program. Our students appear to be very much obsessed with the narrow definition of writing based on the notions of correct grammar and usage. Grammar and rhetorical forms were major concerns of our students since writing was long perceived to be in the service of grammar and secondly the students appeared to have no insights about the qualities of good writing. Therefore; it has become a common practice to use the writing course for error correction and mechanical writing exercises without a true learning experience. In a system where teachers remain the sole reader and students have to write all the time for their teachers, students seriously suffer from a lack of a genuine audience and teachers are led to focus on the finished product rather than the process.

New Hope for Writing with Internet-based Applications

Internet-based applications arrived at a time when we had almost lost our hope for effective implementation of a writing course in the EFL environment. While internet as a technology first appeared institutionally in 1987 through Ege University (Altun 2005) in Turkey, there have been a lack of instructional models and resources for integrating the internet into traditional language classes. Hovewer, there have been several attempts to integrate multimedia and the internet technologies into education in general and few in number in language teaching (Altun 2005, Grace 2000, Altun 1996, İşman 2004, İşman and Çelikli 2009, Dabaj and İşman 2004, Odabasi 2000). Inspite of incresing interest in the integration of internet-based applications into the instruction Writing skill in second or foreign language teaching seems to have received only sporadic attention.

Although educational research in the last several decades has proven that the manifested gender differences influenced students' academic interests, and achievements (Barrett and Lally1999, King et al 2002) and gender is typically a significant factor in several disciplines in particular in educational and psychological research, gender has only received sporadic attention in the studies of language learning. However, different educational domains have different claims to the gender issue. For example, males are claimed to have more positive attitudes than females in using computer technology to assist their academic learning (Li, 2002). Similarly, a number of studies have noted that females are less likely to use the Internet

than males (Ono and Zavodny 2003).It is with the arrival and widespread availability of internet-based applications that we have seen a unique opportunity to integrate the internet into our writing course with an aim to eradicate the above mentioned inherited problems.

Research

The purpose of this quasi experimental research was to explore whether gender makes a difference in using an online forum application in process-oriented writing instruction in an EFL (English as a foreign language) setting. To this end, an interactive website **Mywritingportfolio.net** was constructed for English Prep students to write and send their weekly writing assignments, with an option for other students to read and comment on them. Readers other than peers and teachers were also provided access to the website as guest readers to read and comment on students' writings. Each student was given a password to enter the system and submit their writing assignments online in their own place in their class column. To this end, a questionnaire was administered to the subjects after a semester-long practice. The questionnaire resulted in a very high level of reliability. Reliability Coefficient: alpha= .8271).

Sample and Setting

A total of 227 university English Prep students, 121 of whom were male and 106 female, were involved in this study. The Convenience sampling technique was used in the selection of the participants. At the School of Foreign Languages, there is a six-hour-time block allocated to writing skills per week. For pre-intermediates and intermediates, the focus shifts to essay after studying certain paragraph types. A variety of essay types, namely description, the process essay, the definition essay, the classification essay, narration, cause and effect essays, compare and contrast essays, and argumentative essays are introduced. A "process approach" was adopted in teaching writing in the School of Foreign Languages. The process approach can be defined as an approach that views writing not as product but as a process; helping students explore their own voice; providing teacher and peer feedback; encouraging revision and using student writing as the primary text of the course (Hayland 2003)). The process approach involves six distinct steps: prewriting, drafting, responding, revising, editing and publishing. It is known as a recursive process.

In our system it is crucial for students to give and receive feedback to writings. In an earlier study (Kayaoğlu, 2008) it was mainly the teachers who provided feedback. This was interpreted by students as being authoritarian and formalist. With this in mind, this time peer feedback was compulsory and integrated in the system in the sense that each student was expected to give another three students (peers) feedback for each writing task. Students were encouraged to focus on content rather than the syntax, telling how they felt about writings to create a constant audience to write for in mind. Teachers were told to focus much more on content but not at the expense of neglecting form. While solely language correction could inhibit production, only content feedback might leave students without guidance. To maintain consistency in the feedback system on language and to activate students' higher cognitive thinking, correction codes were used. The codes are colors that the teacher uses when indicating students' errors (such as blue: add something, brown: word order error, red: wrong form, green: subject verb agreement error. The code of colors, which is always available on the site, tells the learner what type of error they have made, and learners can then attempt to correct their errors themselves, using the colors to guide them.

The online tool enabled the teachers to provide feedback in a timely, focused, consequential and organized way since all submitted assignments with given feedback were accessible by topic and date. On the other hand students could modify their subsequent submissions accordingly and become their own editors and could compare their work with the ones commented on by the teacher and other friends.

Procedure

The very first step we did was to get an independent domain name from godaddy.com, which is an online serving company. The domain name www.mywritingportfolio.net was determined to draw the interest of the users. In addition to the domain name, we needed a server in which we would upload our files. The capacity of the server did not need to be more than 100 megabytes since any writing is some 10 or 15 kilobytes, making 100 mb cover more than ten thousand writings. The next step was to develop a forum-based blog. We found that SMF (Simple Machines Forum), which was a free a software that could be downloaded from www.simplemachines.org, was the ideal one in order to meet our needs. After setting up the software in

the server, the forum-based blog was fixed up to the functions for the needs. The forum-based blog included a number of functions allowing the users to shape the portfolio process according to the setting and even putting their own pictures. For this reason the terms "the internet-based application, the forum-based blog, the online system and the website" were used interchangeably in this paper.

So**,** the website **Mywritingportfolio.net"** was constructed for the students to write and send their weekly writing assignments, with an option for other students to read and comment on them. Readers other than peers and teachers were also provided access to the website as guest readers to read and comment on students' writings. Each student was given a password to enter the system and submit their writing assignments online in their own place in their class column. The forum-based blog allowed our students to express themselves publicly in written English, to share their writings with their peers, to have a diverse reader audience, and to see a myriad of writings by their fellow students. Students were supposed to post multiple drafts for the same topic depending on the feedback they received, so they could see their performance over a period of time. Since all postings, edits, comments, corrections, feedback and drafts were automatically stored and could be accessed at any time by date, topic, class and also individual student, all teachers and students could keep track of all postings (writing assignments) online across the school and follow readers and teachers' corrections and previous comments on drafts writings in a very speedy and manageable way. To this end a writing center with a coordinator was established within the school to monitor the whole process. Having been alerted by the results in a study by Odabasi (2000) on 305 fulltime faculty members' familiarity with and use of technological resources at Anadolu University, we organized an in-service training program for the teachers, aiming to stress the practical and pedagogic benefits of using such an online tool for writing course as well as the technical use of the tool. A very similar workshop training was given to the students.

Findings

After a semester experiment with the use of the forum-based blog for the EFL writing class, the questionnaire was administered to the subjects to explore the attitudes of the male and female students towards the implementation of the writing process through the internet based application. Descriptive statistical analysis was decided to be the most appropriate way of displaying data. A non-parametric the Mann-Whitney U test was used in order to see whether there was a statistically significant difference between male and female students in their responses to the items of the questionnaire,

Table 1: The Use of www. mywritingportfolio.net (on line application)

	Percentage					
	Agree		Disagree		No Idea	
	M	F	M	F	M	F
Using mywritingportfolio.net is easy.	76	77	15	13	9	17
I improved my ability to use internet through the internet application -	43	45	41	32	16	24

Male (M)=n 121 Female (F)=n 106

A cross-tabulation of the responses to the two specific items related to the use of online writing course (mywritingportfolio.) reveal a very high strength of relationship between the male and the female learners. It is remarkable to note that majority of the male and the female learners (76% and 77%) agreed that using mywritingportfolio.net is easy. The responses given to the statement concerning whether they improved their ability to use internet with the application show relatively moderate but very similar results. Given the fact that both male and female students were familiar with the internet to a varying degree prior to the use of online writing course, 43% and 45% agreement with the statement by male and female students respectively indicates that the online application served to encourage students to explore greater use of internet while doing their writing assignment.

Table 2: Attitudes towards writing

	Percentage									
	High Positive		Positive		No Idea		Negative		High Negative	
	M	F	M	F	M	F	M	F	M	F
What attitude(s) towards writing have you developed *by using the online application*?	29	31	48	43	15	18	5	7	2	1

Male (M)=n 121 Female (F)=n 106

As Table 2 suggests, both male and female students appeared very similar in their approach to develop a positive attitude towards using online application for writing. This finding was very remarkable in

the sense that male and female students were equally receptive to the experience of becoming an active user of internet-based application. Although it was compulsory for the students to use the form-based blog (mywritingportfolio.net) for writing, sending, giving peer feedback and editing writing, male and female students did not set up defenses against the new application as feared at the beginning.

Table 3: How often do you use online blog?

	Percentage													
	Once a day		A number of times in a day		Once in two days		Once in three days		Once in four days		Once in five days		Once a week	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
How often do you use online blog?	4	6	6	2	15	9	16	10	10	7	30	25	19	34

Male (M)=n 121 Female (F)=n 106

With respect to the frequency of visiting the website for writing course, there was no significant difference between the two groups, but male students were found to visit the forum-based blog more often than the female students. In the absence of information regarding the availability of computer and internet for the students, the quantitative data in Table 2 needs to be interpreted with some caution. Although the students did not have immediate access to the internet, both male and female students visited mywritingportfolio.net more often they needed to do writing tasks. This can be interpreted that they voluntarily spent much more time surfing the pages of the blog.

Table 4: Practicality of forum-based blog

	Percentage					
	Agree		Disagree		No Idea	
	M	F	M	F	M	F
I don't have so much used paper staff in hand after the teacher's correction.	72	70	18	14	10	13
I do not waste time to writings again and again after each correction.	67	69	18	13	14	15
It is so beneficial to have my writings filed by date and the task.	68	71	18	13	14	15

A comparative analysis carried out to examine the difference between the male and female students in respect of their experience of using the online system as opposed to the traditional paper submission model showed that female students had very similar perception and experience with the male student, appreciating great advantage of using an on-line system in terms of keeping their papers well organized and spending considerably less time on revising and editing their drafts.

Table 5: Having papers on the net.

	Percentage					
	Agree		Disagree		No Idea	
	M	F	M	F	M	F
It is very good not to wait for the next lesson to see the feedback of my teacher.	68	59	22	31	20	10
It is very good that others can view my own writing.	62	55	30	12	8	33
I want to impress others with my writing posts.	59	49	27	29	14	22
I pay more attention to my writing since I know that not only my teacher but also the others read my writing.	64	54	26	27	15	24

As indicated in Table 5 above, a similar percentage of male and female students (68% and 59% respectively) were observed to wait for their teachers' comment on their draft on the web with some interest. Another interesting point to note that majority of the male and female students (62% and 55%, with no significant difference between the two groups) appeared to like the idea that they had their audience to read their papers. A greater percentage of the male students enjoyed viewing what other students wrote and desired to impress others. Only 27% of the female students had negative feeling about the idea of impressing other readers with their writing postings. This also indicates that students regardless of gender did not use the forum-based blog solely to post their writing as required by the school. Rather they interacted with each other through the online application to a varying degree.

Table 6: mywritingportfolio.net has improved

	Percentage									
	Very much		Much		A little		Little		Not at all	
	M	F	M	F	M	F	M	F	M	F
My language skill to form grammatically better sentences	12	9	23	34	39	33	22	15	5	9
My use of variety new words	18	13	33	31	33	30	14	20	2	6
My writing ability to write an appropriate topic sentence.	17	13	37	38	26	30	14	12	6	6
My writing ability to write an appropriate introduction part.	11	6	33	41	40	31	13	10	3	7
My writing ability to develop supportive ideas for the topic sentence.	12	6	29	42	40	34	15	10	4	8

The items in Table 6 are intended to diagnose to what extent the objectives of the writing course outlined in the existing syllabus were met with the introduction of the internet-based application. While the process approach was an overall strategy adopted towards writing instruction, there were certain linguistic

elements and writing traditions which English prep students were supposed to master such as writing appropriate topic sentences, introduction part, supporting and concluding sentences. This is what is called the essential parts of a paragraph. Table 6 reveal that a great majority of both the male and female students were observed to utilize our forum-based blog to master these elements greatly. Almost more than 70% of both male and female students were found to very similarly to improve their ability to write appropriate topic and supportive sentences. A very similar trend was also observed for the use of new words. This indicates that both male and female students paid similar attention not only to what were posted to the *mywriting. portfolio.net* but also how they writings were expressed.

Table 7: Preference for writing course

	Percentage					
	Only online		Only teacher centered classroom		Both online and the traditional way	
	M	F	M	F	M	F
How would you prefer to do writing course in your English prep program?	82	73	12	14	6	13

Perhaps the most interesting finding of this quasi experimental study was related to their choice among the three models of delivering the writing course. In response to the question concerning their preference for the way the writing course was to be done, 82 % of the male students and 73% female, as shown in Table 7, surprisingly appeared to choose the option of "only online model. A great majority of both groups, though males slightly higher, was very much motivated toward using process-oriented writing instruction on the basis of forum-based blog. This may be accounted for by the fact that male and female students felt more involved in writing process in real sense in a very interactive atmosphere. It is more likely that they enjoyed independence and autonomy to some extent in their writing experience as they found an opportunity to discover their strength and weaknesses in writing.

Table 8: The Use of blog

	Percentage									
	Always		Usually		Sometimes		Rarely		Never	
	M	F	M	F	M	F	M	F	M	F
I visit the blog very soon to see my teacher's feedback on my writing.	24	23	35	39	24	25	8	8	10	6
After I post my homework to the blog, I read my classmates' writings.	13	14	25	24	37	33	16	17	9	13
First I read the writings of other students and then post my own writing.	9	14	28	26	41	34	16	17	7	13
First I read the writings of successful students, then I write my own.	6	7	14	16	27	21	20	21	33	36
I compare my own posts with others.	5	5	17	18	26	15	23	22	29	39

A cross-tabulation of the five specific items concerning posting and reviewing writings sent to the application in Table 8 indicates that there was no significant difference between male and female students. Both groups were found quiet diligent in using the forum-based blog. It is remarkable to note that both male and female students did not only use the application for sending their assignments for teacher and peer feedback but also they spent a considerable amount of time to read the writings of other students. 75% of the males and 78 % of the females were found to read other students' writing to a varying degree. Another finding worth mentioning here is that 43 % of the female students and 47% of males (adding the percentages from sometimes to always) first read the writings of successful students and then wrote their paper. Similarly 75% of the female and 79% of the male students reported to first read the postings of other students and then completed their own. This indicates that male and female were very often in an interaction mode with the online application.

Table 9: Practicality of forum-based blog

	Percentage					
	Agree		Disagree		No Idea	
	M	F	M	F	M	F
I don't have so much used paper staff in hand after the teacher's correction.	72	70	18	14	10	13
I do not waste time to type my drafts again after each correction.	66	69	18	13	13	15
It is so beneficial to have my writings filed by date and the task.	72	71	14	13	14	15

Table 9 deals with practical uses of the forum-based blog. Overall analysis of four items clearly indicates that most of the male and female students appeared to appreciate the practical benefit of using such internet-based application for writing course. As process approach requires multiple submission with recursive feedback for the same paper, a huge amount of data were kept and organized in such a way that both students had access to any part of the information at any time at their own convenience. 69% of female and 66% of the male students appeared to be happy not having to write the same writing assignment again after each correction.

Table 10: Online feedback

	Percentage					
	Agree		Disagree		No Idea	
	M	F	M	F	M	F
Receiving online feedback from other students is beneficial.	71	63	7	8	12	16
I prefer the teacher's online feedback to peer feedback.*	30	46	58	28	12	16
Giving feedback to other students is exciting.	62	56	22	25	18	19
I prefer giving online feedback for content rather than language	77	70	13	17	10	13

Another remarkable result was that the new practice of students' giving peer feedback received very positive response from male (71%) and female (63%) students. This means that Both gender enjoyed the process of reading and analyzing their classmates' draft, helping others understand their work better. Considering the fact that students needed to read through the hundreds of papers on the www.mywritingportfolio.net to decide first three papers to give and receive feedback either for content or language, and they did not hold back on writing about good points as well as week points of the paper, this was where real interactive online learning environment was constructed. This turned out to be a sort of dialogue amongst the parties of the community which promoted learning. Although the students were provided with an assessment rubric and types of feedback, it was not of any importance whether their comments or offering suggestions for improvement were appropriate. Peer feedback was used in this study as an instructional strategy to increase the quantity and quality of students' online postings. Judging f the number of students' posts and the data, it appears that giving feedback had the potential to motivate student inquiry and to create a learning context in which collaborative learning occurred. The only statistically significant difference between male and female students was observed in the preference for the source of online feedback. While most of the male students (58%) disagreed with the preference for the teacher's online feedback, this was only 28% for the female students.(Mean rank: male121.76, female:95.11, Z:3.232, , P<.001). Female students' preference for instructor feedback can be linked with the notion of writing which has been long associated with producing grammatically correct sentences. Therefore, the teacher's feedback may serve as a form of prescriptive knowledge and formative assessment whereas peer feedback serves to encourage positive motivational beliefs, self esteem and greater levels of interaction. This perhaps explains why both male and female students (77% and 70%) chose to comment on content rather than language.

Conclusion

The overall analysis of the data in regard to the implementation of the process–oriented writing through the online internet application www.mywritingportfolio.net revealed that there was no statistically significant difference between the male and female students. Contrary to some studies favoring males in the use of information technology (Adam and Bruce 1993), this study showed that females as well as males developed a very positive attitude towards using an internet-based application.

The most remarkable result to note that learning was extended to the outside classroom, resulting in a very dynamic interaction. Secondly, perhaps it was the first experience for most students to explore the communicative merit of using rather than learning a foreign language. This meant that they did have a voice and have the enjoyment of being heard. Our online tool mywritingportfolio.net" was not a replacement for lecturers nor was it a sheer self-study space. It was an attempt to go beyond the walls of the traditional classroom in time, space and mood, extending the learning environment to outer space and creating a dynamic atmosphere. This in turn likely fostered independency and autonomous learning in students' endeavor to discover the excitement of voicing their ideas and emotions for the audience other than the teacher. Pedagogically, automatic achieve of all past posts by date or theme created a lot of fun, made it easy to keep track all of our students' postings and readers' responses in a very speedy and manageable way. This provided the teacher with an effective tool to monitor the students' process.

However, there are some negative points to highlight. Since the school failed to provide enough computers connected to the internet, many students had to find commercially available Internet to connect and post their writing tasks to www.mywritingportfolio.net. Outside readers were very few in number and reluctant to comment on students' postings. Although the students found a real opportunity to publish their work instantly online in a very interactive, attractive atmosphere, we do not know exactly to what extent this process was reflected in their final product. This obvious indicates a need to integrate qualitative data so as to get more deep insight into the process.

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HOW TO IMPLEMENT WEBQUEST BASED INSTRUCTION IN THE PHYSICS CLASSROOM

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ABSTRACT

Researchers developed several activities and tools for the effective use of web in the learning and teaching process. One of these activities is WebQuest. WebQuest model was developed by Bernie Dodge and Tom March in 1995. Although there are many WebQuests on the web, there is no clear description of how to use these web-based activities as a part of a teaching method. There are no guides, teacher handouts, or lesson plans in the published studies. In the current study, teacher handouts for the WebQuest Based Instruction were developed to help teachers or researchers in the implementation process. In these handouts, the teacher's and students' roles in the class were clearly defined. Furthermore, the explanations and objectives from the physics curriculum were directly included in it. In this paper, an example for the topic of "fundamental forces" will be presented. Moreover, the observations in the implementation process will be included. This paper was derived from the PhD thesis of the first author.

INTRODUCTION

There is a rapid development of technology in the world. Computers, televisions, and mobile phones are some of the electronic items that students face with in daily life. There has been a dramatic increase in the availability and capabilities of computers than before. This increase has been observed in education as well as other disciplines (Brown, 2001). Effective technology integration to the teaching and learning process has always been seen as an important and appealing issue for the researchers. As the concerns of educational technology, methods, activities, and tools have been developed by researchers in order to have an effective learning environment. As one of the activities, WebQuest activity was developed by Bernie Dodge and Tom March in 1995 (Dodge, 2001). This is an inquiry oriented web-based activity that allow students to work as groups from anywhere at any time (Dodge, 1995).

March (2003) defines WebQuest as "a scaffolded learning structure that uses links to essential resources on the World Wide Web and an authentic task to motivate students' investigation of a central, open-ended question, development of individual expertise and participation in a final group process that attempts to transform newly acquired information into a more sophisticated understanding" (p. 42). WebQuest brings the advantages of the web with it. However, there is no clear description about the usage of WebQuests as in-class or out-class activities. Unfortunately, most of the studies found from the literature did not supply the helpful documents that were used at the process of WebQuest implementation. In the current study, WebQuests were used as a part of the method called as WebQuest based instruction (WBI).

WEBQUEST BASED INSTRUCTION

WebQuests become a widely used tool in order to integrate technology in teaching and learning process since 1995 (Halat, 2007; 2008; Wang & Hannafin, 2008). They help to enhance students' information technology and literacy skills (Russell et al., 2008). Many of the studies found in the literature are about why WebQuest should have an impact on student learning or how to design WebQuests. However, very few studies including WebQuests implementation have been carried out by the researchers. Moreover, in such studies, guides, teacher handouts, or lesson plans were not presented. Therefore, it is hard to talk about a method called as WBI in light of the literature. In the current study, the WBI is defined as an instructional method in which students were expected to complete a WebQuest in the lesson. In this method, students are expected work as groups of maximum three students. The teacher's roles in the WBI are to provide guidelines and to set tasks that are clearly defined in the teacher handouts whereas the students' roles are to follow the steps of WebQuest activity, prepare products, and present them. In the following sections, details of the WBI can be seen.

HOW TO IMPLEMENT THE WBI

The WBI should be implemented in the computer laboratory with at least 10 internet enabled computers for the class size of 30 students. Mainly, there should be following steps followed by the students and teachers in the WBI:

- The first thing to do is dividing the class into groups, which has maximum three students. Each group should have access to a computer in the laboratory.
- Each group receives note-taking papers to write their findings. They take notes from the websites at the resources section with the help of these papers.
- Each group receives A3 or A4 size papers to prepare the products.
- Next thing is to do a brief introduction to the topic of the day by the teacher.
- After forming groups and ensuring the computer access for each group, students go to the given web address for the WebQuest of the day. The teacher makes sure that all students have found the WebQuest page on their web browsers.
- The teacher should inform students about duration of each step which is defined at teacher handouts.
- The students carefully read the introduction of the WebQuest and if there is a need for any help, the teacher guides them.
- Then, they read the task section. At this section, each student at each group should clearly read it to complete the WebQuest. The teacher should ensure if all of the students read the task section. While they are discussing the task, the teacher should check each group to see if everything is going well.
- The students start to follow steps at the process section. They use resources part of the WebQuest to find necessary information to accomplish the given task. They analyze the information they have gathered and take notes for the findings. When the research is completed, neighbor groups come together to share and discuss their findings.
- The teacher can lecture for few minutes if there are any scientific errors in general.
- The students start to prepare the product specified at the task section. At this step, the teacher checks each groups to ensure that there is no scientific errors. If needed, clarifications and corrections can be made by the teacher.
- After completing the WebQuest, each group hands over their products and performs their presentations.
- At the end of their presentations, students defend their findings by answering students' and teacher's questions.
- The teacher uses the rubrics from the WebQuest to evaluate student's works.

TEACHER HANDOUT FOR FUNDEMANTAL FORCES WEBQUEST

With the help of the fundamental forces WebQuest, it is intended to have students to achieve the objectives given in Table 1. In the high school physics curriculum, two class hours are recommended for the topic of fundamental forces. Therefore the WBI for this topic was designed to be completed in two class hours. It is planned for group works and each group should have maximum three students.

Table 1. Objectives list for fundamental forces

Objectives	Explanations
At the end of the lesson, about fundamental forces, students will • Explain force concept with examples • Explain four fundamental forces with examples • Explain Newton's law of universal gravitation	• Electromagnetic, strong, and weak nuclear forces will be detailed in the future classes; therefore, these topics should not be given in details in this class. • Newton's law of universal gravitation should be detailed by giving the relationship between gravity & mass, distance.

Each group should have access to an internet enabled computer and visit http://www.webquestdatabase.com/webquest.php?webquestid=4 for the fundamental forces WebQuest at their computers.

The details of the implementation process can be seen in Table 2. It is expected to complete each step within the respective time interval.

Table 2. Implementation details of the WBI for the topic of fundamental forces

Step	Duration (minutes)	Details
First class hour		
Introduction to the fundamental forces	10	Students: Each student participates in a group and sits in front of a computer with their group mates. At this step they wait for the introduction by the teacher. Teacher: The teacher helps students to make connection between their prior knowledge and what they will learn with this WebQuest. The students learned force, unit of force, and measurement of force in their previous course – Science and Technology. However, four fundamental forces were not instructed at that course. The teacher should point that and inform about what they will learn in the current lesson. At this step, previously prepared note-taking papers and A4 sized papers which are used to prepare presentation script are supplied to the students. The teacher announces that the students can also prepare their product with computer software such as MS PowerPoint.
Introduction section of the WebQuest	3	Students: They start to read introduction section of the fundamental forces WebQuest. This step usually does not take much time to be completed. Teacher: The teacher control students' progress and direct the students who read the introduction section to the task section.
Task section of the WebQuest	4	Students: They start to go over the task section of the WebQuest. In this section, there are the details of the presentation which the students required to prepare. List of the presentation parts is given at this section. Teacher: The teacher visits each group to see if they have problem and asks them to see if they need clarification on the task. If there is any, the teacher clarifies it.

(table continues)

Step	Duration (minutes)	Details
Process section of the WebQuest	To the end of the lesson	Students: After the task section, the students start to follow the steps given in process section of the fundamental forces WebQuest. They may need to visit resources and task sections while performing their research. At this step, the students are required to investigate each websites at the resources section, determine the needed information, and take notes about their presentation on their note-taking papers. Teacher: At this step, the teacher continues to visit each group and control their computers to check which websites they browse. If there are any questions asked by students, the teacher guides them with answers.
Second class hour		
Process section of the WebQuest (continues)	7	Students: The students continue to visit websites at the resources section and collect information. At this step, they are expected to complete their research and compare their finding with near groups. There will be between group discussions. If there are any inconsistencies about the findings, the group members will explain them to other groups. Teacher: Throughout this process, the teacher visits groups and guides them. The questions of the students should be answered. If it is needed, the teacher can make a short lecturing to the class in order to overcome possible scientific errors.
Preparation of the presentations	13	Students: The students start to write their presentation scripts about four fundamental forces. Teacher: The teacher checks the progress of the each group. If there are any scientific errors at students' presentation scripts, guides them to lead correct information, makes necessary explanations, and helps to correct mistakes.
Presentations	20	Students: The students hand over their presentation scripts to the teacher. Selected groups perform the presentations. Teacher: The teacher selects one or two groups to present their findings. At the presentation, the teacher carefully listen the presenter and if necessary, makes the corrections.

OBSERVATION NOTES FROM A SAMPLE IMPLEMENTATION

The teacher guidance is one of the most important issues in the WBI implementation. In the current study, it was seen that, especially, time management should be carefully done by the teacher. In the WBI process, the teachers should inform students about the time required for each step. Moreover, they should remind their students about the time left for the next step. In this way, the WebQuest can be completed in the scheduled time. During the implementation, several problems in computers and Internet connection can occur. If there were not any free Internet enabled computers, the group work can be interrupted. In order to ensure the continuity of the WBI, teachers should prepare either offline electronic and printed copies of the WebQuests to supply in the case of any problem. The students can take any scientific errors from the websites and take that information as true. Teachers should control the students' works to see their possible scientific errors. Moreover, if there were critical errors, the teacher should help students to correct them.

CONCLUSION

As a conclusion, it can be said that the teacher handout about WebQuest based instruction for the topic of fundamental forces worked in the class as expected. The WBI allowed students to be active participants of the lesson and they learned by performing a task themselves. Students enjoy having the WBI and find it entertaining. The teachers can implement the WBI in their classrooms in order to attract students' attention to the lesson and allow students to be active participants of the entertaining learning/teaching process. However, in this study the WebQuest and the WBI was developed for ninth grade physics students at the force and motion unit. It can be recommended that researches can develop WebQuests and their respective teacher handouts for other topics.

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HUMAN ANTOMY IN NON-MEDICAL FACULTIES FROM ROMANIA AND REPUBLIC OF MOLDOVA. PAST AND EUROPEAN INTEGRATION

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Abstract: This paper is a short analysis on teaching "Human Anatomy" in non medical faculties. For this purpose we have analyzed the syllabus and education curricula, as well as the technology of teaching and evaluation from faculties in Iasi (Romania), Chisinau, Balti and Tiraspol. (Republic of Moldova).

All the materials were analyzed in the context of the common past and European integration, taking into account the regional characteristics.

Keywords: Human Anatomy, Romania, Moldova, programs, curricula.

INTRODUCTION

Romania and Moldova represent a geographic area with a common past and similar traditions. In this context it should be noted that 62% of Moldova's population is currently speaking Romanian.

This article is the result of a study on issues related to teaching "Human Anatomy" in some higher education institutions in Romania and Republic of Moldova.

The material presented aims to highlight some milestones in the evolution of the discipline and to set an example for other colleagues that teach other academic disciplines, and desires to promote the idea of integration between the two countries and the European integration of Moldova.

In the following lines we will present a brief history of the universities and faculties in Iasi, Chisinau, Tiraspol, Balti, that were analyzed in this study.

"Al. I. Cuza" University, Iasi, Romania

1860 - Faculty of Sciences comprising the Physics, Mathematics and Natural Sciences departments,
1948 - Faculty of Natural Sciences,
1959 - Geography Faculty in the Natural Sciences department,
1963 - Faculty of Biology-Geography,
1977 - Faculty of Biology-Geography-Geology,
1990 - Faculty of Biology.

"Al. Russo" University, Balti, Republic of Moldova

1945 - Pedagogical Institute was founded with two faculties, one of them being the Faculty of Natural Sciences and Geography,
1959 - Pedagogical Institute is named "Al. Russo",
1954 - Faculty of Natural Sciences is transferred to the Tiraspol Pedagogical Institute,
1992 - Pedagogical Institute "Al. Russo is reorganized within the "Al. Russo" University, Balti,
2003 – as a part of the "Al. Russo" Balti University, the Faculty of Natural Sciences and Agroecology is founded.

Tiraspol State University (Department of Chisinau), Republic of Moldova

1930 - Public Education Institute from Tiraspol Moldova is founded,
1931- reorganized as the Moldovan Institute of Public Education in Tiraspol,
1933 - Moldovan Pedagogical Institute from Tiraspol,
1952 - State Pedagogical Institute with headquarters in Tiraspol, Moldova
1960-1970 Founding of the Faculty of Biology,
In May 1992, the Pedagogical Institute becomes the State University, and in July of the same year it is moved to Chisinau where it functions until nowadays.

"Ion Creanga" State Pedagogical University, Chisinau, Republic of Moldova

1940 - State Pedagogical Institute with the Faculty of Biology,
1950 - the Faculty of Natural Sciences is transferred to the Pedagogical Institute of Tiraspol,

1955 - State Pedagogical Institute "Ion Creanga",
1960 - is joined to the State University,
1967 re-founding of the „Ion Creanga" Pedagogical Institute.

MATERIALS AND METHODS

The material for this study was gathered from documents in the National Archives of Romania, Iasi Branch, the "Al. I. Cuza" University Archives, Iasi, Romania, the National Archives of the Republic of Moldova, Chisinau Branch, and from sources kindly offered to us by the Rectorship at the "Al. I. Cuza ", Iasi and "Al. Russo", Balti, Tiraspol University (Department of Chisinau), as well as the Physical Education and Sport University of Chisinau.

The study programs and syllabus for the subject "Human Anatomy" have been taken into consideration.

RESULTS AND DISCUSSION

"Human Anatomy" in non-medical faculties was a core discipline in the curricula of higher educational institutions.

In table 1, there is shown the Educational plan for the subject "Human Anatomy" at the "Al. I. Cuza" University in Iasi, Romania, between 1950 and 1954. In table 2 there is presented the same discipline curricula at the Chisinau State Pedagogical University, during 1946-1947.

It may be noted that the discipline taught in Romania has been assigned a great number of teaching hours (28-60) and laboratories (30-81). For Moldova the number is almost the same, 30 course hours and 24 hours of laboratory (National Archives of Romania, Iasi, "Al. I. Cuza" Rectorship, no. 17/1950, pp 26, 30, 32, 36; no.174/1953, pp 4, 18, 34; School Inspectorate, Iasi, no. 210,).

Table 1 Curricula for Human Anantomy "Al. I. Cuza" University Iasi, Romania

Nr.crt.	Faculty	Year	Speciality	Discipline	Course (lectures)	Laboratory	Seminary, practical
1.	Faculty of Pedagogy and Psichology	1950-1951	Pedagogy	Anatomy and Physiology of the SNC	60	-	30
2.	Natural Sciences Faculty	1951-1952	Natural Sciences	Human Anantomy	62	31	-
3.	Natural Sciences Faculty	1952-1953	Biology Zoology	Human Anantomy	32	-	48
4.	Natural Sciences and Biology Faculty	1954-1955	Zoologie	Human Anantomy	48	-	81
5.	Natural Sciences Faculty	1954-1955	Natural Sciences	Human Anantomy	48	-	81
6.	Natural Sciences Faculty	1953-1954	Zoologie	Human Anantomy	49	-	82
7.	Pedagogical Institute	1953-1954	Natural Sciences	Human Anantomy and Physiology	29	-	58

Table 2 Curricula for Human Anantomy, "Ion Creanga" State Pedagogical University, Chisinau, Moldova

Nr.crt.	Faculty	Year	Speciality	Discipline	Course	Laboratory
1	Pedagogical Institute	1946-1947	Pedagogy	Human Anatomy	30	24
2	Pedagogical Institute	1946-1947	Botanics	Human Anatomy	30	24
3	Pedagogical Institute	1946-1947	Zoology	Human Anatomy	30	24
4	Pedagogical Institute	1946-1947	Plants physiology	Human Anatomy	30	24

Regarding the name of discipline, as written in the curricula of these two countries, it varied depending on the speciality for which it was taught: Human Anatomy, Human Anatomy and Physiology, Anatomy and Physiology of the CNS (Erhan V. 2007, Giurescu Constantin C. 1970).

The language used for preparing the plans and curricula for university education in the Republic of Moldova before year 1990 was predominantly Russian; the documents drafted after the aforementioned year, are in the Romanian language (National Archives of the Republic of Moldova, Chisinau, P1961, no.22, pp 2, 52, 58, 59, 63).

Educational plans for the University "AI Cuza", Iasi, Romania, consist of the major systems in the structure of the human body, with specifics of related concepts for each of the departments. Unfortunately, curricula from the same years of education plans for the Republic of Moldova were not kept in the archives and we cannot present them.

Currently, plans and study curricula at educational institutions in both countries present more and more similarities. The most important aspect is that the language for education and designing documents is Romanian, favouring the communication between participants in the educational process without additional effort of speaking a foreign language.

"Human Anatomy" is studied as a subject for one semester, 14 courses of two hours and 14 practical sessions of two hours. The subjects covered in the curricula begin with an introductory chapter (anatomical terms, planes of symmetry, topographic regions), continued by the description of the main organ systems of the body. Scientific terminology is used in accordance with Nomina Anatomica, Paris 1956 and Terminologia Anatomica, New York 1998.

Teaching methods include conversation, modelling, experimentation, exposure, problem-solving, computer-assisted instruction, etc.

The evaluation forms are: continuous assessment (oral, written, practical) and summarise assessment (written). The assessment is carried out during teaching; the final evaluation is usually the one that adjusts final grade.

The teaching materials used varies: laptop, video-projector, casts, educational films, drawing sheets, plates, stored materials, histological slides, microscopes, etc.

The bibliography includes the written course (optional). In the bibliography recommended for students in Republic of Moldova we can find more and more specialized titles from Romania and other EU countries.

More academics keep in touch with the students via the electronic system, providing support training and practical work "online" or specialty consultations (Platform "MEDIAEC", Blackboard software, "A I Cuza" University Iasi, Romania).

"Human Anatomy" was integrated in the context of subjects taught in higher educational institutions from both countries and is subject to general rules of educational evolution by joining the Bologna process.

Bologna Process has set out to achieve a single European higher education space and meant for all the participating countries, major changes in legislation and reconsidering the basic principles of education.

Romania joined the Bologna process in 1999. The latest documents about these changes are included in the Leuven 2009 National Report, which provides the main directions on which the evolved Romanian university education focused on: improving the management quality, operational system development between higher education institutions, employer involvement in the higher education institutions business world, functioning doctoral schools and Ph.D. doctoral research evaluation of university institutions and value increase, balancing the value of research in the three cycles of the training process, improving the conditions in the new campuses.

Republic of Moldova joined the Bologna Process at the European Higher Education Conference of Ministers in Bergen, in May 2005. The issue of quality assurance is a main objective of the Bologna Process implemented in Moldova. The decisive role in enhancing the quality of education in terms of organizing the educational process went, firstly to the teacher, from assistant to professor. Therefore the prioritization strategy for ensuring the best quality in higher education is the management and improvement of university teaching potential/continuous education of the University professors.

The objective of quality assurance includes the following:

Teachers training: over the years there have been held various trainings, seminars, training sessions, round tables and conferences on topics pertaining to both the general teaching of the disciplines and the development of the Bologna Process. Some of the topics of these activities were:

Interactive teaching strategies: work/learning-assessment;

Developing syllabuses based on the training standards;

Effective use of the provided technical means of education;

University studies management has resulted in the creation of an autonomous university structure - the “Quality Assurance Department” at Ministry level. Similar structures have been created in all university faculties and departments.

Involving students as subjects of academic training process is a natural consequence of the democratization of university life, internal and external mobility, the Bologna Process as a whole.

The core problem is the subordination of the whole process of specialist training and certification of the standards. Key factors that determine the standards are: the community’s ideal - what society expects from a graduate of the institution, the requirements of the labour market - the development of standards should take into account the formation of skills necessary to provide service that will be

currently used by the graduate, continuous education in the country and the traditions of European experience accumulation.

Beginning with the 2005-2006 academic year, after the country's accession to the Bologna Process there were implemented essentially modified study plans, as required by the national framework plan. Duration of the cycle (three years / six semesters/180 credits) and uncertainty about the second cycle of higher education have led to compression of the content provided above for 4-5 years within 3 years. Consequently, there are two effects, one positive - keeping highly qualified teachers, and a negative effect - overloading students.

In the first cycle, study plans included 5-6 subjects per semester, concluded by the exam as final evaluation form. Introducing 2-3-4 disciplines modules involved not only keeping a single form of assessment, but a conceptualization of the module itself, an exploration of the connections in both inter- and trans disciplinary teaching and evaluation, which in turn have led to quality improvement of education.

The claimed workload is 1800 hours per student annually, as fixed in the curricula for the first cycle. The average of the working cycle audience/contact hours and individual working in different institutions may be different: 1:1, 1:2, 1: 2.5. The "Ion Creanga" State Pedagogical University, Chisinau average for the first cycle was established by decision of the Senate as 1:1. The new plans foresee 900 hours auditory cycle and 900 hours of individual work. For the second cycle there are set a number of 14-16 contact hours per week, which will be part of the 1800 hours required for the accumulation of 60 credits.

Conclusions

Some conclusions deserve to be underlined: in the last 40 years, the current teaching language in the Republic of Moldova was Russian, nowadays the usual teaching language is Romanian; the syllabus and education curricula are changing in Moldova becoming more and more similar to those in Romania (academic credits, objectives, course chapters, bibliography, methods, evaluation procedures); in Human Anatomy the course content and scientific concepts are in conformity with Nomina Anatomica, Paris 1956 and Terminologia Anatomica, New York 1998; each chapter contains macroscopic and microscopic descriptions of anatomical systems; the syllabus is for a semester, there are two hours for course and two hours for practical work; evaluations procedures consist of two papers, one every seven weeks; the materials are classical (moulds, preserved materials, drawings at the blackboard with coloured chalk) as well as modern (computers, educational softs).

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ICT AND CURRICULUM AT SCHOOL'S DECISION. THE ROLE OF CDS IN OBTAINING PERFORMANCE AND DEVELOPING STUDENTS' CREATIVITY

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ABSTRACT
Keywords: educational software, interactivity, performance, creativity, teamwork, e-learning.
The educational system in Romania keeps the pace with the development of communicational infrastructure, according to International Telecommunication Union 2000 which shows that the number of users in Romania increased from 2.67%in 1999 to 4.46% in 2001 and now about 7% in 2010. This is a necessity to the need to adapt the teaching – learning – assessment to the current requirements of advanced education, SEI platform that has extended nationwide.
Thus, in every school, in order to implement new information technologies, there has appeared motivation in the educational process in order to develop the creativity of students.
Each strategy allows each school to develop a school's curriculum. Our school trains graduates to help get the software developer certificate. There are mixed teams of teachers and students who make educational software integrated in the optional course "The development of didactic IT tools for the teaching of sciences". Period of the course: two years (1h/week) for 10th and 11th grade.
The objectives of this course are:

- Forming and developing the skills of using modern means of communication, using new technologies, in the context of the need to form a "digital culture", as an essential element of the minimal qualifications of students;
- Using software applications specialized for development of educational soft: Flash;
- Identifying the connections between computer science, chemistry and physics;
- Planning scenarios and building stages to explain phenomena, processes, procedures;
- Modeling physical and chemical phenomena, as well as making experiments in virtual laboratories which permit a better understanding in case the experiments cannot be analyzed in the school's real laboratories;
- Processing experimental data obtained from observations or through experiments, which can be processed according to the proposed goal, using adequate computer programs.

The final product is to develop a virtual platform which will include "DIDACTIC-VIP":

- Supporting courses;
- Virtual interactive lessons;
- Teaching projects that include concrete ways of implanting ICT in education:
  - Educational software "Alkanes" – author – Silvia Moraru-made in Tudor Vianu National Collge of Computer Science;
  - Educational software "Elements of termodimamics"author Corina Dobrescu, Stan Florina, Sillvia Moraru – made in"Tudor Vianu" National High School of Computer Science;
  - Projects that implement teaching – stages of lessons from educational software, author Silvia Moraru.

  These software are acknowledged by OSIM and having won awards, assert the professionalism and indisputable success of the course.

CHAPTER I. - CURRICULUM AT SCHOOL'S DECISION

The need to adapt the teaching-learning-evaluation process to the requirements of a qualitative education has led to the development of SEI PROGRAM nationwide. Each school develops its own **EDUCATIONAL OFFER**, implementing, aside the **NATIONAL CURRICULUM,** its own CURRICULUM AT SCHOOL'S DECISION.

Each school's curricular project includes all educational processes and learning experiences that the school is offering the students directly. Therefore, performance can be achieved by constructing individual methods of learning through a flexible offer, adjusted to the school's profile and specifics[1].
Starting from 2003-2004 school year, in the curriculum areas "MATHEMATICS AND SCIENCE" and "COMPUTER SCIENCE" our school has been providing the optional course: "THE DEVELOPMENT OF IT DIDACTIC TOOLS FOR TEACHING SCIENCES (PHYSICS and CHEMISTRY)". The optional course addresses tenth and eleventh graders and it is spread across four semesters.
The course is organized to be held by teachers of computer science but also by teachers of physics and chemistry. The final product is THE VIRTUAL DIDACTIC PLATFORM – VIP which consists of [2]:

- Supporting course materials;
- Lesson plans in which there are integrated ICT-based lesson stages;
- Educational software, whose authors are teachers of "Tudor Vianu" National High School of Computer Science;
- Methodological suggestions on how to utilize the created educational software.

CHAPTER II - THE PRESENTATION OF THE OPTIONAL COURSE "THE DEVELOPMENT OF IT DIDACTIC TOOLS FOR TEACHING SCIENCES (PHYSICS AND CHEMISTRY)".

This course targets students who wish to participate in the development and creation of lessons or lesson stages of computer-assisted lessons in the curriculum area 'Mathematics and Science. It is an elective course in several curricular areas (mathematics, science and computer science).

Why should this course be held? - The motivation behind the course

The course offers teachers and students the opportunity to build knowledge and teaching experience in the IT field by developing educational software. In order to assimilate new computer science technologies and to use them effectively, in order to increase access to digital educational resources and to create new virtual learning environments, the course aims to train students in developing software products that form IT tools for teaching science. It offers students the opportunity to assimilate new tools, absolutely necessary for their initiating in the Computer Science labor market.

Who teaches the course? - The ability to teach this course

The course was held by three teachers specialized in: computer science, chemistry and physics. The teachers' didactic and pedagogical experience in developing educational software, the participation in numerous national and international conferences on this subject, with presentation of some interesting educational software, approved by the Ministry of Education of Romania, existing in the AEL educational platform, which exists in every school in Romania.

Evaluation methods

- Assessment tests;
- Projects;
- Portfolios;

The Development of IT Didactic Tools For Teaching Sciences

I Argument

Why is it necessary to have such a course in our high school of computer sciences? There are sufficient reasons, from which we present the following:

- FLASH 8 expert system is extremely wanted on the software market; the students will learn ways to create interesting, attractive and educational animations;
- numerous and diverse applications of mathematics and sciences have been made, among which we can mention: "ALKANES"- educational software for the study of organic chemistry, "ELEMENTS OF THERMODYNAMICS"- educational software for studying thermodynamics concepts , "20,000 Leagues Under the Sea "-interdisciplinary educational software: computer-physics-chemistry-biology.

II General competences

- Training and developing the necessary skills in the use of modern ways of communicating and in new information technologies as part of the minimal baggage of essential skills that students must possess;
- The use of scenarios and the organization of lesson stages for a better explanation of phenomena, physical and chemical processes;

Identification of connections between computer science, physics and chemistry:

- Modeling of physical and chemical phenomena, as well as making experiments in virtual laboratories that will allow a better understanding of them, in case they cannot be realized in the real laboratories of the school;
- Experimental processing of data, obtained from observations in nature or by conducting appropriate computer programs. The processing of experimental data may include carrying out calculations, calculation errors and graphical representations.

III Specific competences

C1 Training and developing the necessary skills in the use of modern ways of communicating and in new information technologies in the context of needing to form a 'digital culture', as part of the minimal baggage of essential skills that students must possess.

C2 The use of specialized software applications for the development of educational software:
FLASH EXPERT SYSTEM

IV Values and attitudes

1. Development of creativity and imagination in solving a problem.
2. Channeling efforts in terms of developing the analysis and designing skills required by society.
3. Using the expert system to develop useful applications in various fields of computer knowledge combined with those of physics and chemistry.
4. Expanding evaluation capacity / self-analysis through teamwork and analysis of piece of work .
5. Stimulating creativity, students and team's initiative.
6. The diversification of concerns in software services.

CHAPTER III -PRESENTATION OF DEVELOPMENT AND USE OF THE EDUCATIONAL SOFTWARE: "ALKANES" AND "20,000 LEAGUES UNDER THE SEA"

A "ALKANES" – 7 interactive lessons of organic chemistry

- Project information
  - software used in class as supporting course material (10^{th} grade), but also at home by students;
  - the molecules of alkanes and isoalkanes are modeled three- dimensionally, students being able to track the progress of chemical reactions;
  - the development of student's imagination and creativity through 3-D modeling;
  - the lessons are structured in the form of revision lesson and are preceded by a diagnosis test and followed by continuous assessment to get feed-back to help future lesson planning;
- What's new in this software? :
  3D modeling of organic molecules and chemical processes
  The simulation of chemical bonds breaking from REACTANTS and forming new chemical bonds out the products of the reaction;
  Developers: MIXED TEAMS of TEACHERS AND STUDENTS;
- Technical Resources
  Programming languages used:
  - Hyper Text Markup Language (HTML);
  - Java Script;
  - Virtual Reality Modeling Language (VRML);
  - Macromedia Flash Action Script2;

- Applications used in software development: Edit Plus2, Flash MX 2004,Adobe Photoshop 7.0, Hyperchem,Cactvs3

- Using software in teaching-learning-evaluation lessons[3]:

-you can access all 7 lessons from the main menu:
a) Structure of alkanes and isoalkanes;
b) Halogenation reaction of the alkanes ;
c) Oxidation reaction of alkanes;
d) Breaking of simple covalent Carbon bonding in alkanes;
e) Pyrolysis reaction of alkanes;
f) Isomerization reaction of alkanes;
g) Chemical processing of methane;

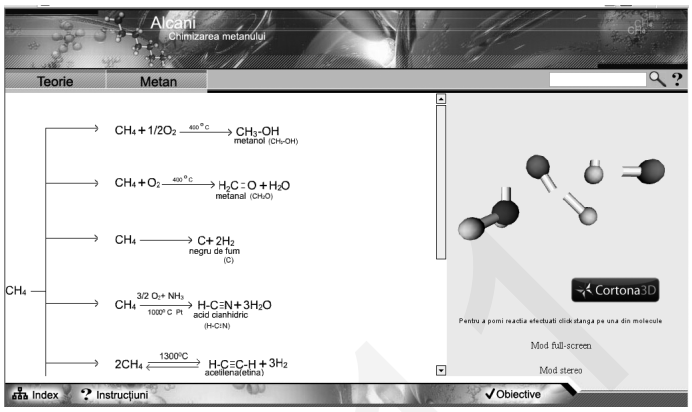

Fig. 1. Chemical processing of methane

Every lesson is accompanied by the diagnosis and the continuous tests, worksheets, real models of alkanes molecules. Each student works both in the laboratory and virtually, on the computer.

- Real aspects regarding the use of virtual lesson stages in teaching-learning-evaluation process.
  - The software, due to its interactivity, reduces the time the student needs to understand physical and chemical phenomena, making the connection between the previously studied physical and chemical phenomena and the physical phenomena that are that accompany the chemical reactions of alkanes: the bond energy, the calculation of bond energy, the calculation of Q given or absorbed during a chemical reaction.
  - The teacher's coursebook is accompanied by a CD containing the educational software t and certain suggestions for conducting the seven interactive lessons from the didactical unit: Alkanes.
  - We present aspects from the interactive lessons: "Methane chemical processing " and "Isomers of Alkanes"

B. "20,000 leagues under the sea" educational, interdisciplinary software physics-chemistry-biology-Computer Science-world literature.

- General presentation of the software[4],[5],[6];
  - the software serves as a supporting course material for universal literature courses(grades V-VIII),chemistry (grades VIII-IX), physics (grades VI-VIII)
  - the development of students' creativity and imagination
  - the understanding of physical and chemical phenomena from Jules Verne's novel "20,000 leagues under the sea"
  - essential rules for correct alimentation
- The planning and development of this educational software highlight the need to achieve the objectives of reference:
  - understanding the specific terms and concepts in physics, chemistry and biochemistry;
  - the development of skills for exploration-investigation of reality and skills for experimenting through use some instruments and procedures in chemistry, physics and biochemistry
  - the development of communicational skills by using physics, chemistry, biochemistry and specific language of universal literature .
  - inculcation of values and attitudes regarding the impact of physics and chemistry on real life;

- re-updating and reinterpretation in a modern vision of the novel "20,000 Leagues Under the Sea"by Jules Verne;

- There are designed five lessons, each with specific skills and each lesson is also given operational objectives;

The lessons are:

a) The presentation of the novel “20.000 Leagues Under the Sea”
b) The expedition under the sea (Archimedes’ force)
c) Producing electricity from chemical energy (cells, nuclear reactions from an atomic submarine);
d) Crew’s menu(biochemistry notions)
e) Instruments in the control room of a submarine;

Educational software can be used sequentially, in lesson stages:

Thus, next we will present 3 sequences from the educational software.

Underwater expedition(submarine), electricity production:cells,nuclear reactor; essential elements of biochemistry

- in lesson L2 “The Submarine”- Archimedes’ Principle is shown using the motion simulation of a submarine based on physical principles;
- Following the virtual experiment in which a submarine is sinking at various depths and calculating for each case, the characteristic physical quantities: hydrostatic pressure, weight (G), Fa (Archimedes’ force).

This lesson can be used as an educational tool demonstration using smart boards and AEL laboratories.

Elements of the lesson are:

a) The theory regarding Archimedes’ Principle, hydrostatic pressure, speed
b) The modeling of the movement of a submarine based on the principles of physics;
c) Making virtual experiments on physical determinations for: Fa (Archimedes force), pressure and speed;
d) Data interpretation
e) Objectives
f) Evaluation to get feed-back

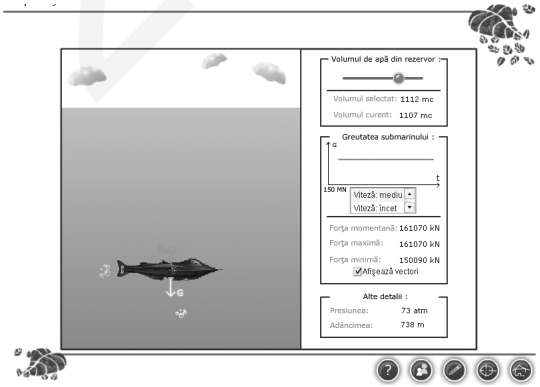

Fig. 2. Submarine expedition

Methodical instructions on how to use the application:

1. Select the water volume so that the submarine descends
2. Select the water volume so that the submarine ascends
3. Compare the values of the buoyant force in both situations
4. Compare the values of the hydrostatic pressure in both situations
5. Explain how the submarine’s buoyant force varies during its movement
6. Explain how the submarine’s hydrostatic pressure varies during its movement

- Methodical suggestions on how to use the educational software:
  - Right after the user opens the novel, he/she is introduced in the science fiction world of Jules Verne. The challenge of this multimedia product is for all students between the sixth and the twelfth grade. The update on the novel which was read by the young user in childhood leads him/her to develop his/her creativity and imagination
  - The teacher-student team can follow the teaching approach increasing the efficiency and the quality of the teaching-learning-evaluation process
  - The underwater expedition stimulates and motivates the student through the interactive teaching approach proposed in the virtual experiment.

In L3 lesson “Fuel cells” there is presented the transformation of the chemical energy into electricity. The lesson contains:

- The theory on the transformation of the chemical energy into electricity
- The theory on redox reactions

- The theory on oxidation and reduction potentials:
  - Daniel-cell modeling and its operation, and the possibility of formatting fuel cell using a different metal electrodes;
  - The objectives of the lesson
  - Evaluation in order to obtain feed-back;

Methodical instructions on how to use this application ("Fuel cells"):

- Select the Movie button and follow the construction of the Daniel-cell in the chemistry laboratory;
- Select the Theory button which presents the scientific knowledge about the construction and the functioning of a cell;
- Select Zn and Cu electrodes for modeling the Daniel-cell in the virtual lab;
- Compare the values obtained for the electrical voltage in both situations (virtual and real lab);
- Select Fe and Cu electrodes for modeling a fuel cell and explain the mode of computing the electrical voltage
- Select one anode and one cathode in order to model the possible fuel cells
- Explain the mode of computing the electrical voltage for the previously modeled fuel cells

In L4 lesson there is presented the "Crew menu" from Jules Verne's novel. These sequences could be used at all chemistry/ biochemistry classes for sixth grade by teachers in all AEL labs. The elements of this lesson are:

- General concepts of nutrition;
- Types of menus pointed out in the diet of the Captain Nemo's submarine's crew;
- Information about ingredients, methods of cooking and nutritional values of the proposed menus;
- The creation of a menu and the computation of its calories;
- The objectives of the lesson;
- Evaluation in order to obtain feed-back.

Methodical instructions on how to use this application:

- Select the Theory button which presents the nutrition rules;
- Select a menu for Captain Nemo so that, at the breakfast, he will eat aliments with the nutritional value equal to 920 calories;
- For the commanded menu, press the I button to inform yourself about the cooking mode
- Select a menu for medium effort;
- Select a menu for intense effort
- Compare the number of required calories for medium effort actions with the one for intense effort actions;

CHAPTER IV: CONCLUSIONS

- This paper presents an interdisciplinary interpretation of scientific concepts related to the science-fiction world envisioned by Jules Verne in his novel "20,000 Leagues Under the Sea";
- The multimedia product "20.000Leagues under the sea "brings back Jules Verne's worldto user's attention and leads him to explain the phenomena studied in chemistry,physics and biology through interdisciplinary;
- The teacher-student team can follow the teaching approach increasing the efficiency and the quality of the teaching-learning-evaluation process;
- The interactivity of this multimedia product initiates the young user in the mysteries of biochemistry, exemplifying him/her what rational nutrition means;

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ICT AND EDUCATION
GOOD PRACTICE IN SCHOOLS IN ROMANIA

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ABSTRACT
Keywords:ICT, e-learning, performance, good practice, innovation.
Paper shows the conclusions of the project "ICT and Education "conducted in 2007-2008, whose coordinator I was. New information technologies are making a contribution to the modernization of teaching-learning – assessment. This presents findings on the impact on educational systems in Netherlands, Finland and Romania. In this project, directors and inspectors have visited in Romania: schools and colleges; laboratories for physics, chemistry, biology and computer science connected to the internet and equipped with necessary infrastructure, students and teachers concerned with implementing new technologies in the teaching-learning-assessment. This paper presents how to make and use multimedia products made joint teams in our schools, "Tudor Vianu" National High School of computer Science, teachers –students, but the use virtual laboboratories for physics and chemistry.
The conclutions of this paper are - ICT has a significant impact on learning-teaching-assessment;

- increase teacher's role;
- obtaing better results in national assessments of our students.

CHAPTER I. COMPARISON BETWEEN THE EUROPEAN STRATEGIES REGARDING IMPLEMENTING ICT IN SCIENTIFIC EDUCATION

The unanimously recognised key words of the European strategy implementing ICT in scientific education are: e-learning, creativity, innovation, e-education, interdisciplinarity.

The European Union launched as an initiative the integration of ICT in educational systems of countries back in 1999 certain questions were the base of the inquiry carried out in 2009 by the European Council[1]:

What are the strategies that lead to implementing ICT in education?
What position and what role are conferred to the new technologies?
What repercussions of ICT do educational systems sense?
What ICT determine the modernization of educational systems?

In Europe, the integration of ICTin education has been done both by schools and by actions of intial and continous development of teachers. Thus, each educational system aims towards:

- The objectives and strategies that derive from policies of implementing ICT in educational systems and schools;
- National initiatives;
- Public/private partnership established for implementing ICT at national levels;
- The 1999 Lisbon strategy that highlighted the necessity of digital literacy and forming the human resource for using the new technologies in the teaching-learning-assessment process.

Finland, Holland are two European countries that started this process right in 1999. These educational systems promote:

a) Learning by "doing"in different practical learning situations;
b) Studying the teacher's role in teaching-learning-assessment process with the help of new technologies;
c) Education focused on the student;
d) The efficiency of learning;
e) The creativity of student;
f) Teamwork (students with different learning levels);

g) e-learning and creativity of each teacher.

An initial strategy was developed in 1995 by the Ministry of Educationn in Finland-The National Strategy for Education, Training and Research in information Society [1], which aimed to achiev two objectives:

- Continuous development of intellectual skills, including ICT ones, with the help of which every student should improve theoretical and practical knowledge;
- Developing information society, based on interactive knowledge.

Based on these findings the Ministry of Education in Finland set four areas for second stage[2]:

- Developing ICT knowledge and skills for the information society;
- Promoting computer networks(as a means of learning);
- Accumulation of information capital;
- Infrastructure development in education and research sectors.

The National Board of Education is the national coordinator of implementation of the programfor basic education (general and secondary), and adult education. It develops networks, makes digital learning equipment, coordinates teacher training and sets up virtual schools.

The implementation strategy of ICT in education schools focuses on:

- ✓ Development of method of learning and organization of learning;
- ✓ Creation of learning materials;
- ✓ Continuous training of teachers and non-teaching staff;
- ✓ Provision of computers, networks and necessary working equipment;
- ✓ Providing both technical support services and educational ones;
- ✓ Development of educational software for all disciplines;
- ✓ Safe utilization of internet;
- ✓ Development of students' digital competencies.

The Ministry of Education of Finland has developed a portal, http://www.tvt.tampere.fi/English [3], which is a component assistant for all school environments, as regards the achievements and implantation of school strategies to use ICT in education. This includes: e-books, tutorial, educational software for all subjects taught in schools, educational package with materials to ensure the promotion of good practice .

During the study visit, which I organized in Romania, acting as coordinator of ARION, with the theme: "ICT and Quality in Education", November 22 to 28 2008 at "Tudor Vianu" National High School of Computer Science, therewas written a Final Report to be sent to European Council in which Finland's efforts were noted for achieving the following: virtual schools, reaserch and development related to learning environments, content production, implementation and impact assessment of the informational strategy.

The project "ICT and Quality in Education", coordinated by myself as school principal and Arion scholarship winner, also scrutinized how the Netherlands has developed and implemented the strategy to achive integration through information technologies in education.Thus, the overall objective is: the upgrading and improving the quality of the provded education. The programmes of the study visit in Romania and in Netherlands have highlighted the performance of Dutch and Romanian teachers in the implantation of ICT in education, mainly in science education. Thus ,I presented the strategy for implementing new information technologies in the "Tudor Vianu" National High School of Computer Science (which is presented in chapter II of this paper)[4].

In educational system, in Netherlands, the structure of a competence is [5]:

- ✓ Seeing: learning
- ✓ Thiking: arranging
- ✓ Choosing: dilemma
- ✓ Doing: acting .

CEDEFOP (European Centre for the Development of Vocational Training)explains the basic learning competencies – Fig.1.

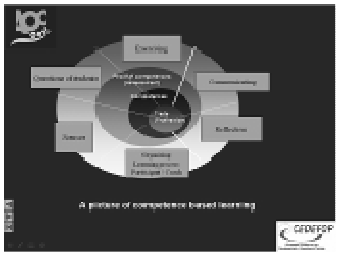

Fig.1 Basic learning competencies

In educational system in Netherlands, in primary education, from 4 to 12 years, which aims to develop the pupils'skills for: physical development and sensorial coordination, studying "DUTCH" landguage, arithmetics and mathematics, artistic development (music and drawing), social activities, health education, history/geography/science (chemistry and physics notions). In secondary schools, the curriculum gives a fixed number of hours for studied but it allows to assign cross-curriculum contents. The schools may decide the teaching methods (Montessori school) and the evalution is made at the end of the semester and the end of the year based on some tests made by CITO (National Instute for Educational Measurement). The secondary education is done between 12-18 years and comprises the following: studying "DUTCH" language, studying English, mathematics, physics, biology, chemistry, IT, history, health education, art, music, drama, dance, physical education.

The implementation ICT into the Dutch educational system was quite a challenge. The process began in 1999 and its main objectives were:

- ✓ The implementation of educational software as a means of teaching and learning;
- ✓ Training of teachers and headmasters;
- ✓ Equal opportunities for all students;
- ✓ The development of international cooperation.

A remarkable program is TANGGRAM program, developed in primary schools, which seeks the following:

- ✓ The establishment of internet connections;
- ✓ The presence of interactive Smart board in every classroom and laboratory;
- ✓ ICT – based school administration;
- ✓ The ability to communicate with parents via the Internet;
- ✓ Training teachers for ICT, at CEDIN.

As an Arion scholarship winner, In February 2007 and November 2008, I closely examined more than 10 educational systems in Europe, and visited over 18 institutions that provide education in the European Union , and I was able to participate in more than 20 classes.Here are some conclusions I have reached:

- ✓ In each and every class, regardless of domain, teachers and students alike use modern teaching-learning –assessment;
- ✓ The key words for a lesson are: interactivity, creativity, attractiviveness;
- ✓ The two members of the teacher–student team continuously communicate;
- ✓ Keeping track of students'responses leads to a fair evaluation of school progress;
- ✓ Maximized efficiency during classes;
- ✓ Training teachers on the use of ICT is done by CEDIN, from the Frisia region;
- ✓ Every school, including those that only have about 60students, is connected to the "RADIUS NETWORK";
- ✓ The semestrial/yearly evaluation is done by Dutch Ministry of Education;
- ✓ The teaching methods are active: "learning by doing works", "learn to learn", "NT2"are just a few examples.

CHAPTER II – THE STRATEGY OF IMPLEMENTATION OF ICT IN IN SCIENTIFIC EDUCATIONIN IN "TUDOR VIANU" NATIONAL HIGH SCHOOL OF COMPUTER SCIENCE

The Objectives of the ICT Implementation Strategy at "Tudor Vianu" National High School of Computer Science

Student Centered Teaching – an Essential Objective in Making a Performing Educational System

The specialized literature, the experience gained during the design and the implementation of interactive lessons places the student in the centre of the teaching – examination process.

What Is Student-Centered Education?

The pupil is encouraged to create, understand and connect all of his/her newly acquired knowledge. (McCombs and Whistler 1997) [6]. Students will be more motivated to learn when they have direct contact with international content. Pupils won't learn information by heart, instead they'll

understand and practise anything they learn as 'co-creators' in the teaching – examination process (McCombs and Whistler 1997).

What Are the Benefits of Student-Centered Education?

The student doesn't directly receive raw information; instead he experiences it through didactic activities created by the teacher. The pupil is implicated in the process with his own efforts. The "student-centered teaching" is the attribute for success in the student-teacher team (North Central regional Laboratory 2000)

How Do We Create Student-Centered Teaching?

The teacher leads the teaching-examination process, designs the layout of the lesson thus helping the student to 'learn how to learn'.

What Are the Steps Needed To Accomplish This Kind of Lessons?

The teaching-examination process needs to be accomplished by the student-teacher team, needs to be active and each didactic activity needs to be authentic, specific and oriented towards applications that will attract the student.

If applied to exact sciences, the student-centered teaching has pointed out the usage of teacher designed "lessons plans", depending on the type of lessons. The didactic strategy consists in teaching the subject in a logical way so that the student is "guided" through heuristic conversation by the teacher. The questions address the whole class and the students, alone or in groups, search for the answer (this is the road towards teaching and applying the "student-centered lesson" model) [7], [8], [9].

Modern teaching puts the student in the center of the educational process that is designed, applied and analyzed by the teacher.

Self-evaluation will determine the teacher to choose the best strategy for the future, depending on each class, group or student's capabilities. The modern didactic designing will stimulate the student-teacher team to efficiently solve the work tasks creatively. Therefore, during the "Oxygen" lesson that takes place in the 8th grade the pupils could rigorously understand the physical and chemical phenomena they encounter during direct or virtual lessons, depending on the location where the lesson takes place.

The precision with which the teacher sets the operational objectives of the lesson, designs the didactic activities (teacher – student) and interprets the feed-back, will influence the "success" of the lack of "success" of the lessons. In comparison, the 'traditional' lesson about "Oxygen" had a success rate of 60%, while the "modern lesson" that determines the student to continuously work for 50 minutes had a spectacular result.

Applying modern didactic strategy , by using the AEL platform, "the didactic project " – THE OXYGEN – makes the pupil capable of communication and permanent collaboration, helps him to consolidate his knowledge by formulating questions or answering the open questions he is asked .

By dealing with the practical activities, explaining the electrolysis phenomenon, the way of obtaining the hydrogen and oxygen from the electrolysis of water, refreshing the knowledge achieved in physics and chemistry, virtually simulating a physical-chemical phenomenon (the electrolysis of bubbly water), outlining all the chemical properties of the oxygen lead to a full participation of the student in the team he works in.

The groups of students, coordinated by teachers, know that during the continuous evaluation (7 minutes), placed at the end of the class, they will obtain spectacular results and so the operational objectives settled by the teacher would be accomplished 99-100%.

These are described in details in the "Oxygen" Didactic Project. The described lesson is based on an extremely well known didactic method, but which has a very poor level of usage and that is "I know – I want to know – what have I learned?"

On the way through the didactic project described above, it is easy to notice:

- The "teacher – students" team is strong and provided with a high level of communication
- The scientific content is carefully selected, is presented in a suggestive way, by making the pupil take part in the rediscovery of every new element of content

The elements of the virtual simulation (the electrolysis of the water, the burning of non-metal substances in oxygen, the oxygen circuit in nature), interactively displayed, transform the student into a "full participant" in the teaching – learning – evaluating process.

By the end of the lesson, both the student and the teacher will have known:

- We know/we used to think we know?
- What we want to know?
- What have we learned?

These gaps are filled in by each and every student and this will lead the "teacher – pupils team" to imagine easier the following step.

Throughout the lesson, the persistent interactivity (educational software to student, student to students, student to teacher) will stimulate the pupil for: his imagination (finding real solutions to the presented problems), his level of applying the studied aspects, the development of his possibility to work efficiently, during a certain time limit with a maximum efficiency in the team.

The interdisciplinary study of the thermodynamics – the laws of the ideal gas – studied in chemistry in the 9th grade and in physics in the 10th grade, has highlighted, by using the ICT methods, the necessity of preparing the teachers in the TIC area.

The ability of using ICT, as shown in the Strategy of Lisbon, is seen as a new form of "digital education", which, together with the classic forms, helps everyone to participate in the society of information. The teacher has the role of selecting the digital resources of learning. Therefore, depending on the pupils, he/she can use:

- AEL Laboratory – virtual platform – a closed system available for every school and high school from Romania;
- Informative materials created by the teacher;
- Digital didactic methods from high-level universities around the world.

This way, the present study provides a comparison regarding the use of these learning methods, dedicated to "The laws of the ideal gas".

The utilization of the AEL virtual platform in the study of the laws of ideal gas has turned to good account [10]:

- A run through scientific notions concerning the isothermal, isobaric and isocore transformations of an ideal gas;
- The student, helped by the teacher, will have a run (according to the didactic project elaborated by the teacher) through the virtual didactic activities involved in the making of the virtual experiments, so as, for each and every transformation, the team, consisting of 2-4 pupils, would be able to deduce the laws of the ideal gas (the law of the isothermal transformation T-constant, the law of the isobaric transformation P-constant, the law of the isocore transformation V-constant);
- The way of learning is chosen by the group of students under the guidance of the teacher. Hence, the didactic activities proposed in the worksheet determine pupils to understand the studied notions, to update the notions studied in physics and chemistry, to put into operation the deduced laws on certain issues;
- The exercises and the applications contained by these methods of study will enable the student to understand the necessity of being aware of these scientific notions (applications in the real life, applications in the industry), leading to the development of his creativity;
- The teacher has the role of coordinating every didactic activity proposed, is active and creative. Thus, he can introduce activities in order to stimulate the children's imagination, making them consider a lesson as a "quest" for knowing the real world and for improving its quality. In the traditionally built lesson, all the student does is to study the laboratory experiments (the transformations of the ideal gas), without having the chance to concretely complete the experimental determinations in a limited time (a class lasts no more than 50 minutes);
- By adapting the informational support to the operational objectives of the lesson, the "teacher – student team" will obtain an outstanding efficiency. The feed-back will emphasize student's ability to apply and operate with the studied notions;
- The study compares and contrasts the results obtained in the continuous evaluations of a "traditional lesson" and those of a lesson in which the ICT methods are used, by focusing on the following issues:
    a. the amount of reservation of the scientific concepts
    b. the amount of applicability of the studied notions
    c. students' ability to explain the natural phenomena based on the studied laws
    d. students' ability to create and solve and proposed exercises
    e. the results obtained in the summative evaluations
    f. students' ability to take part in the improvement of the utilized ICT didactic methods

"TRADITIONAL" LESSON (THE STUDY OF THE IDEAL GAS)	ASPECT	"MODERN" LESSON (THE STUDY OF THE IDEAL GAS)
40%	a	80%
35%	b	80%
40%	c	80%
50%	d	90%
grades > 900 40%	e	Grades>900 90%

-	f	1-2 students propose solutions

ICT Integration in the Curricular Area of Science

The development of the virtual platform "DIDACTICVIP" http://didacticvip.lbi.ro [11] by the teachers of the Science curricular area has underlined the necessity of implementation of new technologies in scientific education. The virtual platform contains: didactic projects at chemistry, physics, mathematics and informatics.

The collaboration of the Science curricular area teachers is materialized in this virtual platform, which can be utilized by any teacher. The methodical-scientific rigor, the high degree of applicability, the proposed modern didactic methods, the accuracy of the operational objectives, the proposed didactic activities, so the Teacher – Pupil team fulfills the purpose of the lesson, which is centered on the student: his capacity of knowing, at the end of the lesson, how to operate with the studied notions. The realization of a modern modality of implementing ICT in the scientific education has led to the modernization of the process of teaching-learning-evaluating.

The digital physics, chemistry, informatics lessons that are presented underline the openness of the school to the outside world (on-line classes) and the efficient use of resources.

From the conclusions of our practical experience, the following are notable:

- the necessity of extending our work in mixed teams : teachers-pupils;
- the development of a creative, innovative character of the lesson, the scientific rigor of the notions presented;
- the continuous realization of a critical evaluation which should lead to self-adjusting our own lessons;
- the necessity of permanent education;
- the realization of an "open learning centre", to facilitate the participation to the teaching-learning-evaluating process.

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IMPACT OF ELECTRONIC ACADEMIC STAFF WEBSITES FOR SCIENTIFIC RESEARCH DOCUMENTATION ON WORLD UNIVERSITIES RANKING: UNIVERSITY OF JORDAN CHALLENGE

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ABSTRACT

The University of Jordan is the first university established in Jordan in 1962 already received more than 125000 undergraduate and graduate students (44th cohorts of UJ graduates). Over the years, UJ have succeeded in crystallizing a central role in offering solid education to successive generations of Jordanians from all parts of the country. If it was not documented it did not happen; the scientific research documentation office was established in 2009 as one of three offices including university website and accreditation offices comprising the Planning and Quality Management Centre aiming to prepare a data base for all UJ faculty members documenting their research, publications, patencies and books on line in order to reflect the real picture of the scientific research in the UJ and improving its ranking internationally. This paper will present achievements particularly the impact of data entry and availability of the academic information electronically on world university ranking.

"World class university" has become a catch phrase amongst all Jordanian as well as regional and international universities; not only for improving the quality of learning, teaching and research, but also for developing their competitiveness in higher education market place through acquiring, adapting and implementing new advanced technologies in the field of education. Most importantly is the electronic communication in the education process.

Although many countries all over the world developed their own systematic ways of identifying and classifying national or local universities, attempts have been made to establish international universities' ranking almost decade ago. The three most comprehensive international rankings; allowing for benchmark comparisons of educational institutions across national borders, are the Times Higher Education Supplement (THES), Shanghai Jiao Tong University (SJTU) and Webometrics. The THES ranking selects the top 200 universities in the world. First presented in 2004, the methodology for this ranking focuses most heavily on international reputation, combining subjective inputs (such as peer reviews and employer recruiting surveys), quantitative data (including the numbers of international students and faculty) and the influence of the faculty (as represented by research citations). Operating since 2003, SJTU uses a methodology that focuses on objective indicators exclusively, such as academic and research performance of faculty, alumni and staff, to identify the top 500 universities in the world. The measures evaluated include publications, citations and exclusive international wards such as Nobel Prizes (Jamil Salmi, 2009). The Webometrics is designed to measure the scientific activity on the web by using different indicators such as the quality of education; the web size, research output and impact.

Few scientists tried to define what world-class universities have that other universities do not, they have identified some basic criteria such as highly qualified faculty, excellence in research, quality teaching, high levels of government and nongovernment sources of funding, international and high talented students, academic freedom, well defined autonomous governance structures and well-equipped facilities for teaching, research, administration and (often) student life (Phillip Altbach, 2004; Khoon et al, 2004; Niland J., 2007). Moreover, recent additions to this definition include range of difficult to measure key attributes objectively such as international reputation of the university and the university contribution to its local society.

The University of Jordan (UJ) is the first university established in Jordan in 1962 -so called the mother university- already received more than 125000 undergraduate and graduate students (44th cohorts of UJ

graduates). Over the years, UJ have succeeded in crystallizing a central role in offering solid education to successive generations of Jordanians from all parts of the country (as well as students from the region and abroad), in contributing fundamentally to the development and progress of the Jordanian society and state and in leading higher education institutions in the country and in many countries in the region. Facing old & new challenges and going through a significant transition – to new horizons and new successes- students, academic staff, administrative team and the top management are determined to forge ahead with a great deal of confidence and courage, with vision, and with well thought-out plans. All are determined to keep UJ at the forefront, not only nationally, but also regionally and internationally.

As we live in a diligent and competitive world, UJ realizes the need to compete and be diligent, to become relevant and effective in today's world. Toward this end, there is a lot to be done in the days to come, and we will be doing it with both joy and faith. As addressed by his Excellency Professor Adel Toweisi; the UJ president; many major challenges need to be tackled without delay. Toward a research university in 2015; on top; UJ should continue to be a center of knowledge and enlightenment, overseeing strategic thinking, planning and quality assurance drive, a radical revision of graduate studies, boosting programs and augmenting methods of instruction and research is also a priority in which a transformation needs to happen in the way scientific research is conducted, making it more international, more human, and more relevant to local, regional, and global needs.

As UJ is one of the early universities in the region which recognized the importance of improving its ranking status on its performance, decision was made early 2009 to establish the Planning and Quality Management Centre directly connected with the Vice President for Scientific Research, Graduate studies and Quality comprising three offices managing scientific research documentation, university website and accreditation.

WEBSITE OFFICE at UJ

Based on Webometrics indicators, the website office at UJ started to analyze the status quo in order to diagnose current practices in which the following important issues were determined as areas that need improvement (Rachil Hill, 2010):

- The presence of one domain instead of minor external domains and no redirects
- The domains must be meaningful i.e. contain full words or well known acronyms
- The URL must be short, without too much numeric codes and must have few directory levels
- The presence of many flashes at UJ website home page
- No enough high term frequency in the content, no metadata in the position of terms, no ALT and anchor from external data
- Concerning the usability, accessibility and search ability; need to have absolute addresses or base declaration, a root for the hyper textual navigation tree and few JavaScript
- The web pages need to be positioned with a meaningful URL rather than such a home page
- The pages must be linked to Google and to other search engines, including pages from the same domain
- Increasing page rank by a dense interlinking to the domain
- Include a web map to the website
- Linking the website with other universities web pages in order to increase visibility especially those who have high page rank
- A useful and practical academic webpage must have portals, directories and search engines

One of the main purposes of the web site office is to increase the digital access activities so more information will be available on line to serve researchers. Besides, to identify the webpage design that impact ranking lists in search engine results from the web publisher's perspective; and to compare the impact of those design factors, and to develop a practical strategy or approach to modifying the ranking (Jin Zhang and Alexandra Dimitroff, 2005).

SCIENTIFIC RESEARCH DOCUMENTATION (SRDO) at UJ

If it was not documented it did not happen; SRDO was established at UJ early in 2009 aiming to prepare a data base for all UJ faculty members documenting their research, publications, patencies and books; on line in order to reflect the real picture of the scientific research in the UJ and improving its ranking. SRDO in the UJ aimed to document scientific research published by UJ academic staff electronically in order to improve UJ

position locally, regionally and internationally. In collaboration with the Computer Centre in the UJ- as pioneers in Jordan- a website for each faculty member or researcher in the UJ (around 1500) was developed containing the following academic information (each in a web page within the faculty website): Research Interests, Published Research, Published Books, Registered Patents, Academic Conferences, Theses / Dissertations Supervision, Awards / Prizes / Orders, Funded Research / Projects, Taught Courses, Ongoing Research and Other Academic Activities (Figure 1). The latter was approved after some modifications made by UJ deans council members, the president and his deputies.

Figure 1: An academician website first page

Life demonstrations started all over the 28 faculties, centers and UJ units in order to show academic staff and researchers how to enter their academic information into their own websites e.g. it took 2 weeks (every day) for Faculty of Medicine staff members to present these demos. All assistant deans for development and quality affairs in the UJ were trained for the same as a follow up data entry for each faculty. In this regard UJ top management made the decision that every new hiring or promotion has to be sent to the SRDO first to be sure that the website data and academic information was entered as required; this enhances and accelerates the entry completion process.

For elderly people, staff members who are outside the country and/or anyone who could not enter his academic information into his website, their resumes were collected and SRDO employees entered their data. This was achieved for more than 90% of the staff in almost 18 months time in which world class universities ranking according to Webometrics was conducted 3 times (once every 6 months) in which a clear progress was noticed.

Table 1 showed the significant advancement in the Webometrics Ranking of World Universities for UJ.

It was concluded that establishing and developing electronic academic staff websites that contain scientific research documentation has a significant impact on world universities ranking. Achievements, obstacles, future plans to improve scientific research based on documented information will be presented in this conference.

Table 1: UJ progress in the Webometrics Ranking of World Universities

Ranking date / position Out of…..universities	International (20,000)	Arabian (250)	Jordanian (28)
July 2009	4874	28	3
January 2010	3246	26	2
July 2010	2462	18	1
January 2011	1823	15	1

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Implementation of Video Recorded Speaking Tasks in Task-Based Classroom Instruction

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Abstract: This study investigates designing and implementing a speaking course in which face-to-face instruction informed by the principles of Task-Based Learning is blended with the use of technology, the video, for the first-year student teachers of English in Turkish higher education. A mixed research method was used to collect data from multiple sources: recordings of a pre-and post-course speaking task, analysis of the video-recordings of students' speaking tasks, informal interviews with the students, and a written end-of-year course evaluation survey. Analysis of quantitative and qualitative data revealed that students made noticeable improvement in their oral communication skills, and they were positive in their perceptions of integrating technology in the lesson. The study also indicated that the use of video camera, as a technological tool, had a positive impact on students' viewing and critically evaluating their speaking tasks. It is suggested that video cameras represent a language-learning resource worthy of further investigation.

Introduction

Second language (L2) courses that combine face-to-face learning and applications of technology, in particular computer assisted language learning (CALL), have been the subject of numerous studies (MacDonald, 2006; Neumeier, 2005; Stracke, 2007). These courses usually require students to attend traditional face-to-face classes and to work independently with a synchronous and/or asynchronous communication tool. As existing studies have shown, this blended approach has become the most popular model of CALL use in L2 learning, particularly in language programmes where CALL components can provide face-to-face instruction with an "efficient use of human and material resources" (Salaberry, 2001, p. 51).

L2 courses that incorporate technology in combination with face-to-face instruction have been found to promote L2 learning effectively as they can give students the flexibility to work independently, at their own pace, promoting language acquisition (Felix, 2003; Singh, 2003). In a study, Ayres (2002) reported that a vast majority of the L2 English and Japanese learners felt that computer enhanced instruction was motivating and appropriate to students' learning needs. In a similar study, Felix (2003) found that the incorporation of technology into face-to-face instruction helped L2 learners of Italian, Japanese and English feel more comfortable with technology and the learning of L2.

As a growing number of L2 learners now experience technology in combination with face-to-face instruction, it is important to examine the value of this technology integrated learning on L2 learners' speaking and their perceptions of technological tools to ensure their success in the learning process. This study seeks to broaden the existing body of research by examining L2 Turkish learners' perceptions towards the use of video cameras as a supplement to face-to-face task-based learning environment, and the effect of using this blended approach on improving students' speaking proficiency.

Related Literature

Task-based language teaching (TBLT) proposes that "the primary unit for designing a language programme and for planning individual lessons should be a 'task' because task promotes L2 learning. An important phase in the TBL framework is the task cycle (Willis, 2009). Willis describes three components of the task cycle - task, planning and report- and highlights that the teacher has a crucial role in each component. She also remarks that the task cycle can be adapted to different teaching situations. Nunan (2004) raises several principles to be considered in a task-based curriculum. Through *scaffolding,* learners should be provided with a supporting framework to facilitate learning. The concept of *recycling* enables learners to maximize opportunities for learning. In TBL, active learning is expected so that learners acquire the language by *actively* using it. Nunan also notes that *integration of form and function* is needed to make the relationships between grammatical form and communicative function clear.

Task-based instruction is considered to be potentially suitable for learners of all ages. It is agreed to be particularly effective when the learners are engaged in relatively similar real-life tasks. As such, task-based language instruction has been employed by many researchers, and it has proved to be highly effective in enhancing the learning of a second or foreign language (Loumpourdi 2005; Stark 2005).

The literature on integrating video-recording of student speaking in language learning offers several advantages: First, students can watch and see themselves and their fellow friends' performances. Similarly, teachers can use video to help students become better speakers in English (Chandra, 2007; Tomalin & Stempleski, 1990). Students also have the opportunity to view the recording on video more than once. Thus, recordings allow students to replay the video as many times as they need; so, they can make self-evaluation of themselves as well as their fellow friends. Students, therefore, become self-critical, as they can see their problems and trace their improvements.

The Study

This study aims to design a speaking course in which face-to-face instruction, based on the principles of TBL is blended with the use of video for the first-year student teachers of English in Turkish higher education.

The study addresses the following research questions:
1. What are the student teachers' perceptions on the effectiveness of video-recorded TBSC as a blended learning environment?
2. What is the contribution of the blended approach to the improvement of student teachers' speaking skills?

Methods and Procedures

The study incorporates mixed research methods, i.e., the use of different instruments and procedures to examine the impact of blended approach on promoting a group of Turkish student teachers' speaking proficiency. Mixed research methods have frequently been implemented by CALL researchers "to strengthen and cross-check the data before conclusions are made" (Levy, 2000, p. 173).

Data were collected from multiple sources: recordings of a pre-post-course speaking task, students' weekly video-recordings of speaking tasks, informal weekly interviews administered with the students, and a written end-of-year course evaluation survey to analyze learners' experiences.

The participants of the study were 28 first-year student teachers of English; seven male and 21 female, aged between 21 -22, attending to a state university in Turkey. On entry to the course, the students' knowledge of grammar and reading comprehension was at the lower-intermediate level, but, they were quite inadequate in speaking skills. None of the students had any prior experience in using video for language learning purposes.

The course was scheduled as three lessons of face-to-face teaching, each lesson lasting 45 minutes, and it lasted one semester (14 weeks). An additional one-hour classroom time was added to the weekly schedule which was devoted to viewing and evaluating students' speaking tasks, which the students video-recorded independently working mainly in groups.

The following steps were followed in developing the framework of the blended TBSC.
Initially, needs assessment was conducted to identify student teachers' speaking difficulties, their perceived needs and expectations from the speaking course and the kind of topics they wished to be

included in the course. To ascertain students' initial language learning needs in speaking, students were invited to speak on one of the argumentative topics below, as a pre-course speaking task:

- Most university degrees are theoretical and do not prepare students for the real world. They are therefore of very little value.
- In the words of the old song "Money is the root of all evil".

Each student was asked to speak into a microphone attached to a PC and their talk was recorded using Goldwave as a record device for further data analysis.

The next stage involved analyzing students' initial speaking using an oral test rating scale, specifically developed for this study. The rating scale featured five categories: fluency, pronunciation, vocabulary, accuracy and task accomplishment, and a clear definition of five descriptors in each category were provided. A score is awarded for each category to a maximum of 20, the whole oral test rating scale totaling 100 points. The global speaking score for each student is calculated by summing up the scores that a student receives for each category.

Each student's recorded speech was listened to several times by the researcher, and was scored using the oral test rating scale discussed above. Another researcher, also familiar with the scale, scored students' speaking independently using the same rating scale. Consistency of raters and agreement among them was high; 92.6%. Any disagreement among the raters (researcher and the second rater) was resolved through discussion (see discussion section for findings). Common problems students experienced ranged from lack of vocabulary and fluency, weak pronunciation, frequent occurrence of language errors.

Furthermore, students were interviewed using a semi-structured interview, lasting between 15-20 minutes. The purpose of the interviews was to evaluate students' present level speaking ability, to elicit their perceived difficulties in speaking, and their expectations from the speaking course. Interviews, which were conducted in English, were audio-recorded and later transcribed for analyses.

Students (*N=28)* stated that they felt anxious and shy about speaking in the presence of others, and their knowledge of vocabulary was restricted. In fact, these problems were already evident in their initial speaking performances. While the initial pre-course speaking task served to identify students' language needs, the same speaking task was given at the end of the study, serving as a post-course speaking task to determine the effect of technology-based TBSC on learning outcomes as will be discussed in the data analysis section.

Designing the Task-based speaking course

Tasks were determined in accordance with the findings of needs assessment. The guiding principles in determining the themes and content for tasks included the students' interests, familiarity, and their relevance to students' needs. Thus, tasks focusing on a variety of actual topics were generated to cater for the present and future speaking needs of student teachers of English. Task-based speaking course (TBSC), as proposed by Willis (1996), was implemented in three stages: Pre-task, task cycle and report.

In the initial pre-task phase, task planning activities were done to provide learners with a repertoire of topic-specific vocabulary, some potential language, and general information students could draw on during the task (Skehan & Foster, 2001). Students read texts or dialogues drawn from a textbook, newspaper articles or other written sources on the theme. During the task cycle, students working in pairs or in groups depending on the nature of the task, made a list of key points covering what they considered to be crucial in performing that particular speaking task. They, then, rehearsed it before reporting on it orally. At the report stage, students presented results of their task orally in groups or in pairs with a focus on meaning and effective communication to convey information appropriately and fluently. Students video-recorded themselves while doing the speaking task. During the next class hour, students' digitally video-recorded speaking tasks were viewed. While viewing the tasks, students' task performance was evaluated using the oral test rating scale, discussed earlier in terms of fluency, pronunciation, vocabulary, accuracy and task accomplishment, and they were given feedback on various aspects of their talk.

In addition to video-recording of their speaking, the students listened to their own speech and transcribed sections themselves. Using task transcripts, students were asked to *notice* and highlight interesting features and the language that they used in their talk. These proved to be very useful in increasing students' awareness of their strengths and weaknesses.

Data Analysis

Student scores from the pre-and post-speaking tasks were analyzed using the Statistical Package for the Social Science (SPSS), version 11.5. Paired Samples T-test was administered to find out if there existed any significant difference between the pre-and post-speaking scores of the students. Data from the interviews and end-of-course evaluation were analyzed qualitatively through content analysis to identify emerging themes and trends. A similar procedure was adopted in analyzing students' written responses to the end-of-course survey evaluation.

Results

The first research question asked what the student teachers' perceptions on the effectiveness of video-recorded TBSC as a blended learning environment was. In general, video-recordings proved to be a very useful learning tool in recording and evaluating the speaking tasks with the learners involved in this study. Asking student teachers to record their speaking tasks independently gave students an important benefit in that they were able to communicate in English, do some additional research on the task, and relate what they had learned in the face-to-face classroom learning environment to the speaking task. The results of the survey on student perceptions indicated that most students acknowledged that recording their speaking was a real challenge for them, and that watching and evaluating their recordings increased their awareness of their own mistakes, as well as enabling them to trace their own progress.

The second research question asked what the contribution of the blended approach to the improvement of students' speaking skills was. First, when the scores from the students' pre-course and post-course speaking task are compared, it can be seen that a considerable progress has been noted for each student. These same students also used a wider range of vocabulary, notably extending their theme-related vocabulary. Additionally, a noticeable improvement in the language used was present.Students' mean speaking score, which was measured as 58.0 before they took the course, which increased to 82.86, as measured at the post-course speaking task, indicating 43.3% of overall average increase in fluency, pronunciation, vocabulary, accuracy and task accomplishment as assessed according to the oral test rating scale. According to the results of the Paired Samples T-test, as indicated in Table 1, a significant difference ($p<.001$) has been recorded between the pre-course and post-course mean speaking scores of students, suggesting that the blended TBSC has had a considerable influence on each student's speaking performance.

Table 2: Results of Paired Samples T-test Regarding Pre-and Post-course Students' Speaking.

Score	N	$\overline{X}$	sd	df	t	P
Pre-course speaking	28	58	5.35			
Post-course speaking	30	82.86	4.75	27	-26.575	.000

Findings obtained from an evaluation of end-of-course survey indicated that students made considerable improvements in all areas in which they felt inadequate in at the beginning of the course. The analysis demonstrated the emergence of several categories: (a) students expanded their knowledge of *vocabulary* and made significant improvements in their *speaking skills*; (b) the interactive nature of pair and group work promoted *collaborative learning* and *incidental learning*, and (c) they appreciated *scaffolding*. The students overwhelmingly indicated that TBSC met their initial expectations. Many students (*N=28*) stated that they had previously been exposed to form-focused instruction, and acknowledged how transition from a conventional grammar-based instruction to TBSC helped students develop their fluency and confidence to speak in English. Furthermore, students stated that while performing the tasks, they acquired both vocabulary and grammar knowledge to enable them to express themselves fluently.

As has been shown from several comments made by the students and based on informal interviews held with them, students are now more aware of the amount of theme-related knowledge they need to acquire. They have started to accept grammar and vocabulary not as discrete elements of language but as powerful means for putting their ideas into communication. TBSC proved to be beneficial in

achieving a balance between accuracy, fluency and gaining a higher level of complexity. This confirms Willis and Willis's (2007) argument that taking the task as a starting point, learners are encouraged to deploy whatever language they already possess, build upon it, improve and expand their capabilities. The findings obtained from this study also confirm remarks made by Foster's (1999) arguments that "…giving learners tasks to transact, rather than items to learn, provides an environment which best promotes the natural learning of languages". (p. 69)

Conclusions

This study reported on the design and implementation of a blended TBSC that combined face-to-face classroom instruction with video-recorded speaking tasks, for the first-year student teachers of English in Turkish higher education. This implementation was found to be helpful in enhancing students' speaking skills by offering an innovative learning experience to students who were able to engage in meaningful interaction, and improve in the areas where they perceived an obvious need for improvement.

Findings of this study are significant in contributing to the related literature as the results indicate that in an EFL/ESL context, a speaking course based on the principles of TBL can be conducive to promoting students' speaking proficiency along with developing their knowledge of language. The findings of this study also advance our understanding of the contribution the use of video-recordings of students' speaking tasks makes to foreign language learning, and offer useful insights to teachers and course designers in designing a speaking course.

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IMPLEMENTING DISTANCE EDUCATION: FACTORS TO CONSIDER

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Abstract

To stay competitive, universities are accumulating a long history of offering courses delivered via online technologies. As the Internet becomes a major factor in education, higher education in the U.S. is increasingly turning to online education technologies to deliver the curriculum at all levels. This trend makes it essential that universities examine closely how to best do so. Depending on the format, online education can often create challenges that may impact the quality of the whole system. In the case of this paper institutional challenges, taken in no particular order, are discussed. They include infrastructure and space allocations, faculty training, faculty workload, student preparedness, academic honesty, intellectual property, and copyright.

Key words: online education, Workload, Intellectual property, infrastructure, faculty training, copyright

Introduction

To stay competitive universities are accumulating a long history of offering courses delivered via online technologies. As the Internet becomes a major factor in education, higher education in the U.S. is increasingly turning to distance education technologies to deliver the curriculum at all levels. On reason for the popularity of online-based courses is the flexibility to choose the time and place to study. Today, Students, and especially adult learners, are struggling to balance their educational needs with a job, family, health issues, and financial worries. Internet classes allow them to learn at a pace that is comfortable to them, at a place of their choosing, and at a time when there are least interruptions. According to Berker (2003) the main reasons given by adult learners in a research study were: to gain skills that will help them get further in their careers, to enrich their lives with more knowledge, to complete a degree or other credential, and to fulfill the requirements of their employers to take educational courses

Today distance education has become an alternative method for delivering academic course work to students. Ryan et al (1999) wrote "The current paradigm shift in higher education is from traditional classroom settings to distance education program delivery via the World Wide Web (WWW)" p.272. Furthermore, distance education eliminates the barriers of time and distance by offering instructional material instantaneously and continuously (Piskurich, 2003 & Bullen, 2003). Merriman (2006) wrote "Online education is entering the mainstream, according to some higher education analysts, and its growing popularity with employers is part of the reason" p.79.

This trend makes it essential that universities examine closely how to best do so. Depending on the format, online education can often create challenges that may impact the quality of the whole system.

Challenges and solutions

Whenever we consider institutional challenges relative to the delivery of online courses, it is necessary to note that there are multiple stakeholders. In the case of this paper seven major

challenges groups are described. The challenges, taken in no particular order, are discussed in the following,

Infrastructure and Space Allocations

Developing and maintaining the necessary infrastructure to support online teaching-learning process constitutes the first challenge. This involves developing or purchasing the necessary computer bandwidth, instruction development hardware and software, faculty support (IT personnel and instructional designers), as well as providing multiple opportunities for training. This is not simple, nor is it inexpensive. Universities have to be successful in attracting a significant amount of state support and external funding to develop the necessary infrastructure for online delivery. For example, Indiana State University, USA, invested in 2004 over $400,000 over a two year period of time to create a television and Internet ready classroom that is in essence a full-feature studio that seats 19 students.

In short, a good quality online education necessitates the transition of instruction from face-to-face to distance delivery that can be quite expensive, requiring major investments in hardware and software. However, there is often another interesting outcome for this transition; the actual need for space declines as fewer and fewer students choose not to attend on-campus courses. In some cases, this has the net effect of programs losing physical space even with significant growth in enrollments.

Faculty Training

Research suggests that faculty as a whole see online delivery of classes as a good thing; they also admit that many, if not most, lack the skills necessary to incorporate it in an effective way. Many teachers have had no prior experience with this method of teaching and the only solution offered to them in most cases was in-service training (Wonacott, 2001). Among the influences to faculty's resistance to teach distance education courses are: a perceived lack of institutional support and training as well as lack of technical training (Clark, 1993).

Indiana State University, through the Center for Instruction, Research, and Technology (CIRT), offers different training sessions as well as one -on- one training for faculty to learn different technologies of delivering online courses and enhancing their knowledge and skills in areas of teaching on-line. The center provides consultations to help faculty troubleshoot any issue with technology. This is very important as students can get easily frustrated if they experience technological issues that hinder their learning.

Distance education department publishes a free e-newsletter that contains important University announcements to help students start and complete their distance courses. Technical support is also provided to students. A toll free number allows students to call 24 hours for technical support. Quality of instruction is also ensured by peer course review, student evaluation as well as evaluation by instructional designers regarding the design and management of the course.

Faculty Workload

Depending on the format, distance education can often create an overwhelming workload for faculty. Several authors agreed that web-based courses require more time and effort on the part of faculty in comparison with classroom courses of comparable size, content, and credit (Tomei, 2005; Visser, 2000; Rockwell, Schauer, Fritz & Marx, 1999). According to Dibiase et al (2005) an increase from 18 students in a class to 49 students increased course-related workloads from 47.5 hours to 116.7 hours.

As faculty become more involved with online methods the workload tends to increase as many interactions with students become one-on-one interaction. So instead of one teacher teaching a lesson to 30 students simultaneously, that same teacher may have hundreds of interactions with the same 30 students to deliver the same amount of instruction and advisement.

Consequently, today a normal load for a faculty in some programs at Indiana State University is to teach three sections of two courses. Often these courses have both the undergraduate and graduate sections. In that case, the professor would actually have three sections of four courses. However, the University is exploring ways to reduce this workload by reducing the number of sections, and faculty are exploring group means such as a frequently asked questions page on their web pages, chat sessions, and other interactive communication tools.

Student Preparedness

As many universities struggle to maintain a 40% six-year graduation rate, lack of preparedness has been a concern for the faculty who reported that they often found that some students, especially traditional undergraduates were not prepared to better deal with online learning. Very little in their educational experiences to date prepared them to deal with the autonomy and responsibility of online instruction. Faculty need to anticipate where students might have difficulty and ensure that the students are using the material and learning on their own. Otherwise the faculty member can expect frustration and a flood of e-mail messages.

Instructors must assume the responsibility of making sure that students are participating in the class, be very accessible, provide progress updates on regular basis, and encourage students to respond to each other's questions and comments.

Academic Honesty

Academic honesty is another challenge in online education. The internet houses a wealth of information ready to be copied and pasted, and often presented as the learner's own work. This can attempt some students who feel they are not doing well enough, or who simply don't have the skills to do the work themselves. This places a different role on the instructor;

To prevent the problem, faculty develop a section in the syllabus that explains academic dishonesty. Faculty also uses Turnitin.com to detect plagiarism.

Intellectual Property

Of significant concern for both faculty and administration is the issue of ownership and use of the materials developed for online delivery. The issue of intellectual property on university campuses in the United States is still a debated issue. Some institutions insist they own intellectual property on developed university courses. Others take a more "generous" position. Faculty on the other hand, tend to desire to retain ownership rights. In most instances faculty is required to sign a waiver for each course they are paid to develop. The waiver states that both the faculty and the university own the materials and have the right to use them in the future.

Copyright

One small but significant challenge is the use of copyrighted material for Internet based courses. Not all the data and information on the internet can be used without proper approval or proper referencing. The instructor may also have materials that are available for nonprofit educational institutions but can not be posted to the Internet by the instructor. This would require the instructors to look elsewhere for pertinent materials for the class (Wonacott, 2001). Copyright laws were amended in 2003 to include these issues.

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IMPROVING CREATIVENESS OF COMPUTER GAMES PRODUCED BY STUDENTS THROUGH APPRECIATIVE LEARNING APPROACH

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ABSTRACT

Both computer games development and appreciative learning approach are still in their early evolutions at educational setting. By ignoring the educational power of computer games development and appreciative learning approach, educationists could risk losing a valuable tool and pedagogical strategy. Therefore, this study attempted to investigate the effectiveness of appreciative learning approach and computer games development combination in enhancing students' creativity in terms of the products produced. The study applied randomised subjects, with control group experimental design and involved 69 Malaysian form one (grade seven) students, aged 13-14 year-old. Computer Game Assessment Inventory (COMGAIN) was created specifically to assess the product's creativity in terms of the computer games produced by students. It generated a Cronbach's Alpha value .726. It was found students in treatment group exhibited a mean score of 6.62, which was significantly higher at .05 level of significance compared to the mean score of 5.35 exhibited by the control group. Therefore, computer games development and appreciative learning approach combination offers a great opportunity for improving the creativeness of computer games produced by students. Nevertheless, computer games produced by students have more rooms for improvements.

KEYWORDS: Appreciative Inquiry; appreciative learning approach; creativity; computer games

INTRODUCTION

The study of computer games and its players is not possible to be mapped into one research discipline, as it normally covers scopes such as computer science, education, psychology, youth, media and/or cultural studies concurrently (Kirriemuir & McFarlane, 2004). Therefore, this study attempted to look at a bigger combination of technology, pedagogy, and creativity simultaneously. Computer games aligned with the younger generation's habits and interests (Eow, Wan Zah, Rosnaini, & Roselan, 2009; Paraskeva, Mysirlaki, & Papagianni, 2010; Ulicsak & Cranmer, 2010). However, the use of technology alone does not motivate students whom have been living in the midst of technology all their lives to put more effort in their endeavours (Killi, 2005). Therefore, students need tasks and constructive learning environment that capable in encouraging them to work beyond their existing abilities while producing creative work.

Computer Games

Children spent a big amount of time playing computer games, with an average of 13 hours per week for boys, and 5 hours per week for girls (Gentile, Lynch, Linder, & Walsh, 2004). The amount of time spent is increasing with time evolvement, as Yee (2006) found youth spending about 22 hours on computer games per week. A survey carried out by Entertainment Software Association (2010) revealed male gamers as having an average of 12 years game playing experience, while female gamers have an average of 10 years. At Malaysian situation, a survey conducted on 236 students of grade seven in one of the secondary schools shown 75.8 percent were gamers while almost 91.3 percent of the boys engaged with computer gaems (Eow et al., 2009). The big population of gamers is also represented by the year 2009 computer games sales' statistics in United States, which generated an amount of US$10.5 billion dollars (Entertainment Software Association, 2010). Therefore, it is becoming increasingly difficult to ignore the fact of computer games as the contemporary culture of today's youth.

Computer games is one of the ideal ways reaching out to students whom have been growing up in the playstation generation (Kearney & Skelton, 2003). Prensky (2007a) also suggested students to be allowed to

explore with technologies they love using, characterize their age, and be able to prepare them for their 21st century. Keyboarding and word-processing skills in preparing assignments are deemed to be unable in providing up to date technological sophistication level required by students (Niederhauser & Lindstrom, 2006). Therefore, in this study, computer games development was used as a tool to engage students. However, the cost for computer games development which commonly reported in millions of dollars is often used as a reason to argue against its utilization at educational settings (Oblinger, 2006). Nevertheless, as technologies progress aggressively, games development tools become more widely available and affordable for non-professionals. Some games development tools are available for a reasonable licensing fee while some can even be downloaded free. These games development tools are such as Game Maker, Torque Game Builder, Golden T Game Engine, The Game Creators, and 3D Game Studio. Therefore, computer games development is a new learning opportunity for the current generation of students.

Product's Creativity

Creativity is complex term and there is no single or universally accepted definition of creativity (Treffinger, Young, Selby, & Shepardson, 2002; Vidal, 2005). Different researchers defined creativity differently according to their context of study (Rhodes, 1961; Torrance, 1993; Treffinger et al., 2002). Creativity has been defined as a process, person, product, and press or the quality of environment that nurture creativity. This study embarked on creativity as a product produced by students. Product is an effect of creativity (Cropley, 2001). It can be tangible or intangible. As for this study, computer games developed by students are the tangible products. Among the most popular tool in assessing product's creativity is Creative Product Analysis Matrix or CPAM (Besemer & O'Quin, 1999; Horn & Salvendy, 2006). However, no matter how popular the CPAM may be, it might not be suitable as per se for the purpose of this study. A computer game may not be logical or useful in real life as evaluated by CPAM. In addition, the elegancy element of CPAM to be evaluated on computer games does not necessarily encourage gamers to keep playing and trying. Therefore, instead of using CPAM as an instrument for this study, CPAM was adapted and altered to suit the context of the study.

In order to produce a creative product through computers, people need social supports (Selker, 2005). Instead of adapting the approach of learning from technology, students should be trained to learn from thinking by using technology to engage them to think and take actions (Jonassen, Howland, Moore, & Marra, 2003). The use of technology alone does not motivate students to express their creativity optimally since the current generation have been living in the midst of technology all their lives (Kiili, 2005; Reid & Petocz, 2004). Accordingly, computer games development could be fun but it is not an easy stand-alone option to enhance creativity among students of the 21st century. Therefore, appropriate pedagogical strategy is warranted for optimal creativity enhancement. Appreciative learning approach, which based on Appreciative Inquiry (AI) as both theory and practices, was tapped as the pedagogical strategy in this study.

Appreciative Learning Approach

AI theory focuses on the co-evolutionary search for the best in people and the relevant world around them (Cooperrider, Whitney, & Stavros, 2008). Instead of focusing on problems, what is not working and why; AI theory seeks to discover what is working particularly well with the students and what they desire to achieve (Cooperrider & Whitney, 2005; Lebrun, 2007). Positive images of oneself and the world around would inspire the subjects for more volunteer actions and innovations. Subsequently, it counters initial negative images, beliefs, and expectations. Appreciative learning approach provides opportunities for students to be heard; explore; dream; taking actions, and share their products, ideas, and dreams through its 4D*s* model which consists of discovery, dream, design and destiny stages. Therefore, appreciative learning approach as a pedagogical strategy would offer great potential and encouragements for students to produce better creative works.

The public tends to perceive teaching as a simple task, merely requiring the teacher to present information to students, have them learn it, and evaluate these students to see whether they have attained the learning materials (Stringer, 2008, p. 14). However, teaching is much more complex than the general assumption. It requires extended body of professional knowledge in which teachers are not only accountable for creating active classroom environment but also making students feeling safe in taking intellectual risks and expressing

their creativity (Tighe, Picariello, & Amabile, 2003). Tighe et al. (2003) added that teachers themselves should be opened to students' responses, even if those responses are with little relevancy. Since AI theory and practices stress on appreciation and positive reception of others' ideas and creations without negation or criticism (Cooperrider & Whitney, 2005), appreciative learning approach could be an ideal pedagogical strategy in encouraging students to express their creativity without fear.

STATEMENT OF THE PROBLEM

One of the objectives in The National Education Blueprint 2006-2010 was to develop human capital in order to be creative, innovative and marketable (Malaysian Ministry of Education, 2006). However, most teachers still stick to the conventional teaching mode, which mainly taught students to remember factual information and return them in the form of examinations. This seriously hold back students from exploring new ideas and being creative (Northcott, Miliszewska, & Dakich, 2007; Vint, 2005). Even many parents did not want to spend time entertaining their children's curiosity (Lee, Zulkifli, & Loh, 2008). As a result, the mean score for creative thinking index among Malaysian secondary school students was recorded to be much lower than American students of the same age (Chua, 2002). In addition, Malaysian employers described their employees as having insufficient creativity (Ramli & Abu, 2006). Hence, there is a need to facilitate Malaysian students in boosting their creativity.

Although computer games have been noticed to be the younger generation's habits and interests, yet they are still in the early stage of evolution at educational settings (Oblinger, 2006; Prensky, 2007b). This study did not intend to manipulate computer games as another information transmission. On the other hand, it was manipulated as a technological tool for innovating. Most studies of computer games have been carried out at higher learning level (Cagiltay, 2007; Ip, Capey, Baker, & Carroll, 2009; Schaefer & Warren, 2004) but studies among lower secondary students merely stay untapped. Most researches focus on changing people and behaviour by using problem as a base to be fixed (Watt, 2007). However, Cooperrider and Whitney (2005) noted that by starting from the standpoint of problem, it will create more problems. Instead of negation and criticism, AI focuses on the subjects' past and present capacities in creating possible future (Cooperrider et al., 2008). Yet, only a limited numbers have been done at classroom settings (Donnelly, 2004; Yballe & O'Connor, 2000). The application of appreciative learning approach as a pedagogical strategy to enhance students' creativity in terms of the products produced had not been probed previously. In fact, a search for Malaysian AI practitioner through the AI community list at http://appreciativeinquiry.case.edu/ proved futile. Both computer games development and appreciative learning approach are still in their early evolutions at educational setting. By ignoring the educational power of computer games development and appreciative learning approach in enhancing students' creativity, educationists could risk losing a valuable tool and pedagogical strategy. Therefore, this study intended to fill these gaps.

PURPOSE AND OBJECTIVE OF THE STUDY

The purpose of the study was to investigate the effect of appreciative learning approach and computer games development combination on students' creativity in terms of the products produced. Thus, the objective of the study was to compare the level of product's creativity between treatment and control groups.

METHODOLOGY

The effort in assessing the effectiveness or impact of a program is best to be carried out through experimental or quasi-experimental designs (Treffinger et al., 2002). Yet, to date, experimental research studies demonstrating the effects of AI are not readily available due to the qualitative nature of the AI process (Roper, 2006). Therefore, this study attempted to increase the objectivity of measurement by using randomised subjects, with control group experimental design. It is regarded as one of the simplest designs, yet one of the most powerful of all experimental designs (Ary, Jacobs, Razavieh, & Sorensen, 2006). Treatment group applied appreciative learning approach while control group used self-paced learning, followed by do-it-yourself (DIY) session. Students in both treatment and control groups were engaged with computer games development. Creativity as a product was quantitatively measured. The study was carried out concurrently for both treatment and control groups. Each group was facilitated by an independent teacher. Researchers remained objective by working at an emotional distance, and interacting as little as possible with researched subjects and the context.

Students in control group had total freedom during the session since they adopted self-paced learning with game module as a guide and followed by do-it-yourself (DIY) session. As for treatment group, students were guided through the respective sequence of discovery, dream, design, and destiny stages (Cooperrider et al., 2008). Discovery stage was done with the intentions for the gamer students to see new potentials and possibilities. During discovery stage, group conversation was carried out by facilitator. Students listened to each other's stories of success as defined by another person's values. It was the starting point of inquiry in a non-threatening, engaging, and interesting way (Preskill & Catsambas, 2006). It was also an opportunity for students getting to know each other. Group conversation lasted about 20-30 minutes. Then, it was followed by students' discovery of Game Maker through self-exploration, guided by game module adapted from Habgood and Overmars (2006). This was similar to the self-paced learning session carried out by control group. Next, in dream stage, students were asked to dream of how they wanted their own games to be. They sketched or noted down ideas and dreams on the papers provided. As for design stage, students started to develop own computer games based on the dreams and desires they generated in previous stage. As for destiny stage, facilitator guided the students to create their own executable file and engaged again in the group conversation. Students were led to think on how they are going to empower their skills and knowledge in Game Maker.

Only the existing gamer students who were interested in learning computer games development, and have been playing computer games for at least the past two years and are still actively playing were selected for the concern study. Researchers did not intend to create another group of computer games enthusiasts. The study involved 69 (35 and 34 in control group and treatment group respectively) Malaysian form one (grade seven) students, aged 13 to 14 year-old. In order to reduce the interaction between students from control group and treatment group, different school was selected to function as control group. Both schools were identical in terms of the academic performance, social status, and discipline aspects. Appropriate measurements were taken in forming the two almost identical groups. Besides choosing two identical schools in terms of academic performance, students' social status and discipline aspects, additional conditions that strictly considered for equivalency were students' years of experience in playing computer games; computer competency; time spent playing computer games per week; age; gender; and creative perception.

Computer Game Assessment Inventory (COMGAIN) was created specifically to assess the product's creativity in terms of the computer games produced by students. Teacher evaluators filled the first section of COMGAIN. It contained game framework, game content development, and game polishing constructs, which were based on originality. Originality refers to the ability to generate new and unusual ideas or options (Treffinger et al., 2002; Vidal, 2005). The descriptions of each dimension used in the study are show on Table 1. Game framework, game content development, and game polishing constructs in this study were assessed through the seven points Likert Scale ranging from 1 (extremely undeveloped) to 7 (extremely refined). The scales in between were 2 (undeveloped), 3 (slightly undeveloped), 4 (neither undeveloped nor refined, exactly the same as module), 5 (slightly refined), and 6 (refined). Extra guidelines for the assessment were prepared for teachers' reference in order to reduce the inconsistency in the product's assessment. Meanwhile, the second half of COMGAIN, consisted of novelty, arousal, and centrality dimensions. The dimensions being assessed were quite subjective since the judgement could be depended on the persons who rate them. The second half of COMGAIN was based on the five points Likert Scale, which 1 (very disagree), 2 (disagree), 3 (slightly agree), 4 (agree), and 5 (very agree). Student evaluators were chosen from the same age range as the sample. The selection was due to the rationale highlighted by Lubart and Sternberg (1995) that evaluators tend to rate product's creativity more accurate for products produced by their own age cohort. The average score from the three student evaluators was then calculated. Based on the data collected, COMGAIN generated a Cronbach's Alpha value .726. A value of .70 is generally agreed upon as the lower limit for Cronbach's Alpha (Hair, Black, Babin, Anderson, & Tatham, 2005; Runco, 2010).

Table 1: Description of dimensions within COMGAIN

Dimensions	Description
Game framework	Standard framework for the start and end screens. The start screen displays name of the game and buttons; responsible for starting the background music; and initialising other game settings. The end of game screen displays congratulatory or failed to achieve mission message; activates the high-score table for students to insert their name; and lead back to front room.

Game content development	Actual game play. Relevant characters, objects, events, actions, sounds, commands, backgrounds, music, rooms, and messages are developed.
Game polishing	Design of games to be more presentable, playable, and being different from the game modules provided.
Novelty	Relates to attribute aspect. Descriptive terms such as different; delighted; appealed; unconventional; and unique were used.
Arousal	Relates to affective domain. Descriptive terms such as fascinated; excited; stimulated; engaged; and overjoyed were used.
Centrality	Relates to preferences aspect. Descriptive terms such as favourable; desirable; appealing; interesting; and attractive were used.

FINDINGS AND DISCUSSIONS

Product's creativity is part of the outcomes of creativity (Horn, 2006; Torrance, 1993). Appreciative learning approach group produced significantly better product's creativity than the control group. This was proven true from the separate perspectives of teacher and student evaluators, as well as the combination of both. Table 2 presents the analyses results of independent samples t-test on product's creativity scores. Obviously, students in treatment group gained higher scores in all the product's creativity dimensions. The differences between control group and treatment group were significantly different at .05 level of significance for all the dimensions and product's creativity as a whole, except game framework and game polishing dimensions.

Nevertheless, the mean scores for all the dimensions evaluated by teacher evaluators did not display levels deemed satisfactory. Teacher evaluators assessed students' game framework as just slightly above the description of neither undeveloped nor refined level while game content development as slightly below the concern level. Game polishing dimension was even worst with the scale below 1 (extremely undeveloped). These situations could be due to the limited knowledge and skills in Game Maker as students were newly exposed to Game Maker. Csikszentmihalyi (1996) stressed on the need of knowledge and skills mastery in creating product's creativity. The game framework, game content development, and game polishing dimensions were assessed based on originality. Originality refers to the ability to generate new ideas and getting away from the obvious or common piece of works (Treffinger et al., 2002). In addition, Vidal (2005) described original ideas as leading to unique, surprising, and remarkable products. However, although statistically students in treatment group produced significantly better game framework, game content development, and game polishing dimensions than the control group, yet most of the assessed dimensions did not differ much from the game module. Therefore, more efforts are needed in helping students to develop computer games tailored to their dreams and ideas instead of just following the game modules provided.

Statistically, student evaluators judged computer games produced by treatment group as offering significantly more novelty, arousal, and centrality features compared to the control group. However, student evaluators were just slightly agreed on the dimensions being evaluated. There were more rooms for improvements as the maximum scale is 5, with the description of very agree on the dimensions being assessed. Nevertheless, it was highlighted that the assessment of creativity through products produced is complicated since it involves subjective judgement that a person has toward an object (Cropley, 2001; Horn & Salvendy, 2006). Computer technology is fast evolving (Prensky, 2007b). The assessment of novelty, arousal, and centrality of the computer games produced by students in the study could be worn off as computer games technology evolves with time. The student evaluators might have exposed to the latest technology of computer games which involves deep immersions through the three dimensional features. Thus, it justified the slightly agreement by these student evaluators on the elements of novelty, arousal, and centrality.

Table 2: Independent samples t-test analyses on product's creativity and its dimensions

	Group	n	Mean	SD	SE	Levene's test for equality of variances		t-test for equality of means		
						F	Sig.	t	df	Sig.
A. Teacher evaluator:										
1. Product's creativity	Control	35	2.752	.1769	.0299	.414	.522	-6.006	67	.000*
	Treatment	34	2.886	.1369	.0235					
2. Game framework	Control	35	4.220	.3142	.0531	2.892	.094	-1.914	67	.060
	Treatment	34	4.344	.2135	.0366					
3. Content development	Control	35	3.651	.4008	.0677	2.253	.138	-3.096	67	.003*
	Treatment	34	3.918	.3098	.0531					

4. Game polishing	Control	35	.384	.0286	.0048	2.892	.094	-1.914	67	.060
	Treatment	34	.395	.0194	.0033					
Student evaluators:										
1. Product's creativity	Control	35	2.593	.5858	.0990	18.15	.000	-10.177	51.17	.000*
	Treatment	34	3.730	.3017	.0517					
2. Novelty	Control	35	2.696	.5941	.1004	3.570	.063	-8.890	67	.000*
	Treatment	34	3.753	.3630	.0623					
3. Arousal	Control	35	2.560	.6921	.1170	17.480	.000	-9.338	46.01	.000*
	Treatment	34	3.749	.2932	.0503					
4. Centrality	Control	35	2.524	.6671	.1128	13.924	.000	-9.118	51.68	.000*
	Treatment	34	3.688	.3496	.0600					
Product's creativity (Total)	Control	35	5.345	.6715	.1135	10.971	.001	-9.795	52.98	.000*
	Treatment	34	6.616	.3671	.0630					

*significant at .05 level of significance

CONCLUSION

As a conclusion, computer games development and appreciative learning approach combination offers a great opportunity for improving the creativeness of computer games produced by students. This study also provides a basis for future investigations on the application of appreciative learning approach as a new pedagogical innovation to try out at educational settings. Educators have historically used direct instruction to stimulate students' learning, by positions himself or herself in front of the learner and demonstrates or tells the students how to accomplish a task (Sagor, 2005). Sagor commented that direct instruction might not be the best pedagogy. Students are thinkers. Educators should not treat students as parrots. Computer games development may be an ideal task in engaging students of the playstation generation actively while appreciative learning approach may be an appropriate pedagogy in leading the students. Nevertheless, caution is warranted as this study shown that the computer games produced by students have more rooms for improvements.

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INFORMAL LEARNING THROUGH EXTRACURRICULAR ACTIVITIES IN KHON KAEN UNIVERSITY

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ABSTRACT

Although more formal forms of instruction (i.e. classroom and e-learning types) have always been the effective media of transferring learning to students in universities for years, more informal methodologies of learning through extracurricular activities are important to optimize the learning process of students. Studies showed that success in an organization depends not only on the high intellectual capability of those involved in the organization but more importantly, on the extracurricular skills of its people. This paper is aimed at sharing the experiences of Khon Kaen University in terms of the learning of its students through its extracurricular activities. Learning in the university takes place also through unstructured processes sponsored by the school to complement classroom teaching, such as getting involved in reforestation programs, birds watching club, and youth camp. As a result, the university has now succeeded in transforming its students to become ideologically oriented and dedicated environmentalists.

Keywords: informal learning, extracurricular activities, Khon Kaen University

Introduction

The terms formal and informal learning have nothing to do with the formality of the learning, but rather with the direction of who controls the learning objectives and goals. In a formal learning environment the training or learning department sets the goals and objectives, while informal learning means that the learner sets the goals and objective (Cofer, 2000). Informal learning describes a lifelong process whereby individuals acquire attitudes, values, skills and knowledge from daily experience and the educational influences and resources in his or her environment, from family and neighbors, from work and play, from the market place, the library and the mass media. Extracurricular activities are known as a part of informal learning in the school/university over a number of years. What are extracurricular activities? Extracurricular activities are activities performed by students that fall outside the realm of the normal curriculum of school or university education. Extracurricular activities exist at all levels of education, from 4th-6th junior/high school, college and university education. The extracurricular made its first appearance in American colleges in the nineteenth century (Miracle &RogerRees,1994). It complemented the curriculum as much as subverted it. The students found in it a kind of laboratory for practical and vocational interests. It looks good on college and job applications and shows admissions officers and employers you're well-rounded and responsible. This paper is aimed at sharing the experiences of Khon Kaen University in terms of the informal learning of its students through its various extracurricular activities.

Methodology

This study investigated participation in extracurricular activities in the Department of Environmental Science, Khon Kaen University as a contributor to long-term educational success. Five areas are described: personal-social characteristics, academic achievement, educational aspirations and attainments, participants' roles in activities, and environmental social context. Participants were the graduates of each academic year and company or organization recruiters that they were questionnaire and interviewed. Extracurricular activities, programs offered by a school system that do not form part of the academic curriculum in the department range from sports to reforestation (Figure I- IV):

Inter Cup

Inter Cup is a sports event organized by Environmental Science students. Activities include football, valley ball, cheerleading, during 2 days. The aim is to promote relationships between students from various universities in Thailand and to support extra curricular activities, particularly, sports.

Figure I Events on Inter Cup Day

Reforestation Program

This program was organized by the Environmental Science students to encourage rural community to plant trees on their lands or common lands for adaptation to climate change .Students were granted subsidies of 20,000 Baht per year to plant trees, and were allowed to transport by the university buses.

Figure II Reforestation Activities with Local Community

Bird Watching Club

In fact the bird watching club welcome anyone who has an interest in wild birds whether you are not the environmental Science students. Members learn from one another and most members are eager to share their knowledge. The point of the club is to see more birds and learn about them. Members learn how to identify wild birds and how to use birds as bio-indicators for monitoring environmental change as well as to enjoy birds watching in nature. Students were granted subsidies of 10,000 Baht per year.

Figure III Bird Watching and Nature Tour on a Fieldtrip

Youth Camp

Young people have the key role in resolving global challenges in the future. The target of the Youth Camp is to find young people interested in natural science and help them raised up their knowledge in these fields. Youth Camp is free of charge for participants. The main organizers are Environmental Science students**.** Students were granted subsidies of 20,000 Baht per year.

Figure IV Youth Camp on Forest Ecosystem and Forest Restoration

Results

Significant relationships were found and recruitment implications were discussed. The most basic reason for joining a club or team is that it gives the students something better to do than staring at the wall, wandering the hall, or napping all afternoon. People who are involved and engaged are less likely to become addicted to bad habits, like smoking or drinking. For many students, extracurricular activities present an opportunity to practice social skills and to experiment in activities that may represent a career interest. Education is not solely learned by reading the text-book, students can learn an incredible amount from their peers through extracurricular activities. Students learn how to compromise and work in

a group. Extracurricular activities also allow students to meet and interact with peers that may not be within their close group of friends. In addition, extracurricular activities help to enhance these social skills and teach lessons not being learned in a classroom. Extracurricular activities give students positive activities in which to be involved, and they spend their time in a productive manner. The key points that will be made in this claim of fact are that the students involved in extracurricular activities will receive better grades than those who are not involved in extracurricular activities. In addition, activities will improve the overall students. Therefore, they help students to receive better grades by teaching them the characteristic building lessons, teaching them lifelong skills, saving some at risk students who would possibly drop out of school, and helping the students to develop social skills. From the interviews of companies or organizations, there is widespread agreement that success in organizations requires more than high intellect. Thus, college recruiters commonly examine job candidates' extracurricular activities in search of "well-rounded," emotionally intelligent, and interpersonally skilled students. Colleges not only look at potential students' academics, but also at their extracurricular activities. Activities of the students participated will tell the college the important aspects about the students such as how they've made a meaningful contribution to something, what their non-academic interests are, whether they can maintain a long-term commitment, whether they can manage their time and priorities, and what diversity they'd bring to the student body. Extracurricular activities are very important indeed. However, an overload of activities can be a strain on the budget and also on time. The best thing to do is to set limits. Figure out what you can afford in money and time and go from there.

Conclusion

Therefore, administrations of schools/universities ought to continue their funding of extracurricular activities since it clearly benefits the students' academic achievement. Schools should encourage students to participate in extracurricular activities since they benefit the students in so many ways. Also, the schools should educate the coaches and group sponsors on the influence that the extracurricular activities have on the students' lives. Activities are not solely about what the score is, how many wins or losses are attained during a season, or what place is won at a competition. They provide and instruct students with lessons that will last them a lifetime.

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INFORMATICS EDUCATION IN DIFFERENT DISCIPLINES AT UNIVERSITY LEVEL: CASE STUDY: A SURVEY OF STUDENTS' ATTITUDE TOWARD INFORMATICS TECHNOLOGIES

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ABSTRACT

One area of information technology quickly becoming ultimate is the field of Informatics. To meet this growing need universities are beginning to develop degree programs with the integration of Informatics. In response to the widespread use of and ever-changing nature of Informatics, various investigations were carried out regarding attitudes toward informatics.
This paper attempted to investigate university student attitudes toward the integration of Informatics Technology in their departments and factors contributing to their attitudes so as to provide some constructive information and suggestions for the adoption of technology in informatics education. For survey, we selected a private university in Istanbul. We saw that a new established university is so appropriate for similar studies. In this paper we are going to investigate the informatics theory on students with a questionnaire.
Keywords: Informatics, information technology, informatics theory

INTRODUCTION

The rapid changes that take place in science and technology and developments also affect communication and information technology to a great extent. The rapidly spreading improvements have been felt in all parts of life. These transformations and developments have accelerated the creation, expansion, sharing and utilization of knowledge and they have also become the basic components in public services and economy as well as in information training. It is not quiet logical today to say that only acquiring knowledge is meaningful. Contributing to information production, acquiring changes and improvements as soon as possible and using these are the greatest targets of the modern societies.
When talked about computer assisted learning today in the world, it does not mean computers confined to laboratory settings anymore, instead the holistic outlook of countries to their education systems; a design and problem solving process come to mind. In order to be successful and productive in today's society, even more important than that, to build the inhabitable society of tomorrow, it is necessary for learning to learn, thinking to learn and coming to a understanding on how technology can be used in humanity's service.
Technology greatly affects daily life when looked to school walls. Technology has become an indispensible part of individual life in various areas from ATM's to internet connection. In most of the workplaces, technology usage has become the most preferred knowledge and skills.
In educational environments, the speed of the technological developments suitable to be used in these settings is unfortunately faster than the understanding of the value which these new equipments have contributed to and the pace of applying conscious applications. Therefore, naturally, negative and useless consequences such as the worshipping to technology, seeing the hardware side of technology as a must or having firm dependence emerge. In fact, the way of taking advantage of technological capabilities is more than only acquiring hardware and having internet connection.
As information technology has become the measure of successful performance both in business world, at school as well as in academic areas in recent years the need to integrate technology within educational activities have emerged in many parts of the world. The changing world order, by revealing concept of globalization, have the increased the importance of factors such as competition, and price in the world economy. An intense competition has been observed in the world economy together with the improvement of the information technology, the abrogation of custom walls and the international trade liberalization efforts. In this context, the opportunities brought by technology push the institutions to provide more vigorous and efficient services in global settings.
Today, a number of researches have been made in the integration of computer-aided applications in universities Here, two issues strike one's eyes. The first is that the studies done are not completed truly

towards the interdisciplinary education and the second is that the concept of information technology is seen from technology perspective. Based on this deficiency, studies that help the retention of information more easily should be done. Technology stands out as a numerical concept. However, there are a lot of departments which are not numerical/ quantitative and students of them are present in universities. In order for these students to comprehend issues in their field faster, they need information technology point of view. The main goal of information technology is not only rendering the easy usage of information technology equipments but also helping the retention of information longer in human mind, therefore, fostering the consolidation of new information. So as to provide this, the information technology concept should be transferred with interdisciplinary mentality. For this, the curricula of different disciplines ought to be examined and the most convenient information technology elements to be applied should be determined.

2. INFORMATION TECHNOLOGIES AND THEIR INTEGRATION

The concept of data processing can be briefly defined as the result that is produced when technology and information is jointly utilized. Data processing has some aspects: computer software, computer hardware, and computer user and information society. We can define data processing the results we attain when information and technology are jointly used. The English term information technology (IT) is Turkish equivalent of information and information technology. The second most important element of information technology is computers. The computers are composed of computer programs (or software) and the electronically physical components (or hardware) and these are two basic units. Previously, we were writing letters to our relatives and friends but nowadays we can write an email with the aid of a computer and send it. Also we can make net meeting with a camera and a computer. The computers keep data in a magnetic disc that is unique to them. With the help of special commands, when a need arises, the computers send the needed information in a understandable way through the outer environment unit called monitor after finding the required data.

Information technology is a combination of all technologies that include accumulation, storage and processing of data and the connection of data through cables which makes communication possible for a user. Information technology is a concept used for communication and computer systems connectable to all information services.

It is not possible to sort out information technology with only computers. The major information technologies covering a wider product range are computing and accounting machines used in companies and offices, insulated metal and cable products, electronic gadgets with other electronic parts; the products related with television and radio transmitters, telephone and telegraph line machines, television and radio receiver equipments, sound and video recording devices, photocopy equipments, auxiliary equipment, services related to telecommunication and computer.

The services in particular pertinent to information technologies are the wholesale sale of machinery and equipments and their procurement, the renting of office machines and information technology devices including computers, which can be cited as example of cervices related to telecommunication and computing.

Information and communication technologies are thought to increase their importance in educational settings in the future. The goal of researchers and educators who want to spread scientific literacy nowadays ought to be the development of new equipment and technologies; therefore, the instruction of information technologies and the integration of it to learning activities. Educators can use information technologies with the whole class, small groups or individuals. The educators can use information technologies for the presentation of knowledge, demonstration of process and skills, explanation of concepts, delivering of instruction, the formation of bonds between concepts and ideas, the demonstration of video with audio, and the exhibition of writings for the entire class (Meadows, 2004). One of the hardest tasks of students and educators is the application of information technologies to other subjects and the integration of it in an ordinary class. In this process, this learning activity possesses the attributes for the adaptation and integration of informatics which can lead the way for educators.

The information and communication technologies, which are claimed to be at the center of the technological advancements related with globalization, are now seen as the indicators of the information society we are in. The technological developments have accelerated the research processes of scientists. While the universities are rendering cost-effective education to students by using information technologies, they have reached higher qualification and flexibility (Tural, 2002).

The main objective of technology education is improving the level of technology literacy of societies to a certain extent, namely, to increase it. Technology education contains the education towards technology

which we come across and which finds usage. The science and technology education is forming the basic components the man power that are masters of science and technology and bringing up technology experts for technological advancement and innovation. As such, the education that requires expert knowledge which is higher than the education literacy dimension is in question. In this case, a connection which has scientific dimensions could be mentioned with technological construction and systems which find usage in our daily lives or in different points of life and which can be improved. In education and technology relations, technology has been used to bolster education. This is used for supplying the educated and qualified human resources of the country and it improves general efficiency of education. Furthermore, some new technologies also develop distance education. Thus, meeting old demands and the opportunity of conferring top notch education in case of inadequacy of source of qualified personnel is formed.

3. EDUCATIONAL TECHNOLOGIES

Although educational technology, which is nourished by computer sciences, systems theory, cognitive sciences, psychology, sociology and some other sciences and which has some unique attributes and which is a multidisciplinary field, it is within the "educational sciences". In order to define educational technology, many expressions have been put forward by several institutions and organizations and it has been agreed upon in related committees and meetings. The expression above is the last educational technology definition of Association for Educational Communications and Technology (AECT), which is the international organization of educational technology. While educational technology is the name of a discipline, it has been used both as the expression of this discipline around which an application is developed and the name of developers' profession. In this respect, those individuals who work in the direction of information and principles put forth by the "educational technology" is called educational technologist. All the technologies introduced are called educational technologies.

When we analyze educational technology with its items, we see that it encompasses a large area from theory to application. Many elements stretching from educational psychology to learning and teaching activity are included within the scope of educational technology. The interaction of these elements among each other and their organic connection constitute the technology aggregate. When technology is developed for any educational discipline, the relationship between the estimated targets, for that area, and these elements that form technology with current applications must be taken into account.

While the importance of training and research system that depends on specialization in certain fields still continues in education, it gives its place to interdisciplinary and multidisciplinary research, with a growing trend. We may not yet say that this change is rapid and salient, but we may argue that the change of trends is in this direction. Discipline is the name given to a research area which has a unique educational background, methods and content and which proved that it can produce new information in any field and can develop advanced-level information in aforementioned field (Berger, 1970). Every discipline possesses a distinctive doctrine, a professional language, terminology, and intellectual pioneers and followers (Becher, 1989:22; Parker, 2002:374.).

The main dimensions of knowledge within a discipline is taken on and developed such as historical knowledge, theoretical knowledge, analytical knowledge, practical knowledge, experimental knowledge, empirical knowledge …etc

The dictionary meaning of the term "interdisciplinary" is the integration or containment of two or more academic disciplines or research areas. Therefore, inter-disciplinary presumes the use of arrangement of a priori information which is structured according to traditional academic disciplines. If you need to make a short definition, inter-disciplinary as a concept means to incorporate and to contain two or more disciplines (Kline,1995; Klein,2000; Cluck,1980)

The concept of information technology is seen as the product of inter-disciplinary education and research environment. Information technology concept opens new opportunities for under-graduate, masters and doctoral level students who wish to pursue their research and development careers in academic or industrial settings.

Information technology lessons enrich the multi-disciplinary research environment of students.

The generated large amount of data which is collected with different methods needs the effective transformation of useful information and information accumulation for organizations. An information technology system comes into existence with a series of method and applications that transform data into information and information accumulation in order to support decision making and controlling. These systems besides by safeguarding information can distribute it to related elements inside or outside an

organization. The study area of information technology systems is related with analyses and design of these systems. Consequently, an information technology system is a discipline that integrates the technology and management of information systems in a certain field.
So as to ensure that education and learning process is effective, long lasting and more comprehendible, information technologies should be integrated into all lessons and all the individuals from the administrators to students should be enlightened in learning and teaching processes.
The USA, the leading country, and a lot of countries have taken necessary steps in topics related to hardware and network/internet in order to make educational technologies widespread. However, to make the educational systems really effective on student achievement, issues such as quantitative content and teacher training necessitate serious studies. Moreover, applications in the areas of hardware and network connection are almost inadequate and severe inequalities exist among regions in many countries. When we look at these four areas, for instance, related with the agreed targets in the United States, how national educational policies and goals should be determined becomes evident. The existing formulated target in the USA in hardware area is that all the teachers and students should have the latest model of multimedia computers in their classrooms. The objective in network connection is that all the classes should be connected to information highway. The aim in digital content is the supporting students with effective educational software and online resources in educational environments. The goal in professional development is that all teachers should have necessary in service training and support services so that their students can use computer technologies effectively. Whether the identified four goals in these four areas are being met can be measured according to indicators in every area.
Cradler (1996) is recommending some elements that should be kept in mind so as to integrate technology in school curriculum. These items can be summarized as follows: the needs of learners, the availability of resources, the determination of educational needs related to education and technology design and the supplying of technical support and counseling in technology usage for teachers. From the studies done in literature, two chief targets in technology integration can be suggested for the effective usage of technology in schools: One is how technology (for instance computer) will be used and the instruction of how information can be accessed. The other target is the effective usage of information technology (IT) and capabilities (accessing, processing and analyzing of data). According to Mehmet (1995), in order to attain these goals, educators should take into consideration the results of the studies done in the area of educational technology and the contextual factors affecting learning targets. Teachers play especially an important role in establishing technology integration in training and education processes. The success of technology integration and students' effective usage of technology at school are contingent upon teachers' behaviors and their wishes for internalizing technology.
University which is one of the important components in societal transformation and its pioneering role in usage of technology in education and development are also significant for societies' adaptation to these technologies and the formation of information society. In order to increase technology utilization in universities, primarily lecturers should be eager to use these technologies in lessons and should reach relevant resources when needed. On the other hand, the demands and expectations of students in the usage of technologies in the lessons is also an impetus factor for the existence of educational technologies in classrooms.

4. A STUDY BASED ON STUDENTS' OPINION ON THE INTEGRATION OF INFORMATION TECHNOLOGY TO LESSONS IN DIFFERENT DISCIPLINES IN HIGHER EDUCATION

Within the scope of the lessons of information technology or basic computer technologies, students are given basic information technology concepts, about which the information technology has reached to the point from past to the present, as well as practical education on the standard application software. The most crucial points of this lesson are basic concepts of information technology and computer usage basic training. The commentary of university students related to the scope of this lesson will have a positive effect in the development of this course.
The students are required to answer the survey questions, below, as "I Strongly agree", "I agree", "Neutral", "I do not agree" and " I strongly disagree".
A) The opinions of students on classical education method

1-)The classical plain explanation method in technology lessons is enough for me to understand the subject and system.
2-)Reading a text by looking at the picture in the book to understand the system is not boring and difficult.
3-) I can easily animate the subject in my mind by looking at the picture in the book and reading a text.
4-) I definitely have to repeat myself after the subject is told in so as to understand the system.
5-) It is absolutely necessary for me to comprehend the subject
that the teacher first explain it.
6-) If I understand the structure of the subject thoroughly in lesson, I become successful in workshop applications.
B) The opinion of students about constant visual materials
1-) Besides the picture in the book, I can fathom the book completely by the still pictures shown by a projector.
2-) I can grasp the subject with one picture displayed by a projector.
3-) I can understand complex systems easily with a still picture.
4-) It would be better if more than one picture instead of one was shown in order to grasp the system.
5-) I need extra course materials so as to understand the subjects.
6-) I can keep my focus on the subject without getting bored in course environment.
C) The opinions of Students on Computer Assisted Education
1-) There is absolutely a need for computer assisted education-teaching in education
2-) Computer is an ideal equipment for education.
3-) Classical system is sufficient for technology education.
4-) There is no difference between computer assisted- education and that of classical one.
5-) Computer assisted- education can be used as a method to supplement classical system.
6-) I can learn a subject by myself with the help of computer assisted-education, without a teacher's lecture.
D-) The ideas of students on motion picture
1-) I can more easily understand the structure of systems and subjects with moving picture.
2-) Animation is highly effective in the instruction of complex structures.
3-) There is no difference in facilitating understanding between the motion picture and still picture.
4-) I can more easily focus my attention on a subject with the aid of computers and moving pictures.
5-) The topics that seem abstract to me can be more understandable with moving pictures.
6-) Examining change in the system by punching the variables myself is required for my learning.
This research was applied to students of Science and Letters Faculty's, Economical and Administrative Sciences Faculty's, Communication Faculty's, Applied Sciences Higher School's Turkish Language and Literature, Translation and Interpretation, Psychology, Management, Visual Communication Design, Public Relations and Advertising, Radio, Cinema and TV, Journalism and Accounting Information Systems departments of a foundation university (private) in Istanbul
Ten basic expressions are used in this research. These 10 basic expressions were synthesized from the literature on computer usage on education. The sources used are listed at the end of the article.
1. To reach conventional education and training goals during the education program as a tool
2. To widen and enrich education whilst the education program
3. To motivate the learners
4. To support the learners about thinking on their learning.
5. On other conditions, providing those outside the curriculum a chance for an accession.
6. To increase the efficiency in education
7. To lower the education costs
8. To make education more efficient
9. To prepare for work life
10. To decrease the inequality among the students who reach Information and Communication Technologies in different ways.
These expressions reported above are evaluated by students of different faculty and departments of a foundation university. A foundation university is deemed eligible for this study. The newly established foundation universities have been making arrangements and updates in order to take the course curriculum to a degree for their faculties and departments. Especially within the scope of information technologies which is often appropriate to give a common curriculum, computer, information technology etc, from time to time the suitability of courses for students is an issue that should be considered. Based

on this idea, a newly founded university, that is, assessment of a university with an unsettled information technology course curriculum will give accurate results.
The Analysis Summary
The persons who answered the survey were reported to be 210, as of April 30, 2010.
160 individuals (76 %), whom participated in the survey, claimed that information and communication technologies are indispensible part of education.

5. CONCLUSION

Based on the findings of this study, most of the people answering this survey have agreed to the idea that information and communication technologies are indispensible parts of education. Another derived significant result is that the participants of this survey are of the opinion that the education of information and communication technologies should be bolstered. One other outcome that can be obtained is that the students' computer skills can not be sufficient.
The results drawn form these data put forward the significance of this study. This study will form a serious preliminary study in getting the ideas of people about the usage of Information and Communications in Education in Turkey. The obtained data will be compared with the studies done in other countries and will form the precedent knowledge on the situation of Turkey's ICT and education.
Every university, and even more important than that our whole education system, ought to have a mission and plan about educational technology. Educational technology, which is within systematic approach, for the evaluation of decisions with more objective criteria such as the determination of goals, strategy and solution suggestions, technological applications, integration and the evaluation of results is the necessity of research and continuous scientific reporting.
As a result of this study, the effective and efficient usage of technology as an educational tool can have a noticeable effect on students' achievements, attitudes, communication among teachers and their peers; it can also develop students' interactive, individual learning and high level thinking skills.
Effective technology integration requires radical changes in education and learning system and teachers and the schools that teach them play a key role in this process. Therefore, technology integration devoid of a well-informed, skillful and well-trained teacher will not bring any benefits to education.
In order to meet the related expectations about the utilization of technologies in universities in developed countries and the development of new technologies, the units that just work on this topic have been in operation for a long time. It became obvious that in a variety researches conducted in our country, in strategic plans of universities, in order to meet the determined necessities, these departments should be established within Turkish universities and become widespread.

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INSTRUCTIONAL DESIGN FOR DYSAUDIA STUDENTS IN CSCL SITUATION

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ABSTRACT: With the largest population in the world, China leads in the number of disabled people. In order to promote educational justice, Special Education in China has been performed at various levels. CSCL has been applied in special education for the disabled. On the basis of analyzing the shared features and learning styles of the students with listening disabilities, effective strategies of performing CSCL are selected in this study. Moreover, resource design principles and design modules for practical learning resource are presented accordingly in order to enhance the learning proficiency for students with listening disabilities. The thoughts and processes of the above teaching design prove to be effective in practical teaching.

KEY WORDS: Dysaudia Students; CSCL; Platform; Instructional Design

INTRODUCTION

Computer Supported Collaborative Learning (CSCL) has been more widely used in higher education. Currently, there is still a lack of awareness with regard to special education groups. The author will design the basic procedures of teaching combined with dysaudia students with the characteristics and the functions of CSCL teaching, and explore in a number of issues about CSCL for dysaudia students' learning.

I.THE FEASIBILITY OF THE APPLICATION FOR CSCL IN HIGHER SPECIAL EDUCATION

In this paper, we choose dysaudia students as research subjects.

1. PROMOTING COMMUNICATION IN BOTH TEACHER-STUDENT AND STUDENT-STUDENT, REDUCING THE LONELINESS

Dysaudia students have certain learning barriers, lack of timely and sufficient interactions when they use sign language to communicate with others in real life. In general teaching activities and communications with the teacher, they usually feel lonely. In CSCL learning, teachers and dysaudia students can communicate through the discussion board which can reduce the communication barriers between learners and teachers. So CSCL plays a particular role in enhancing the communications between teacher and students, as well as students and students.

2. ENHANCING LEARNING INTEREST AND IMPROVING ENTHUSIASM AND INITIATIVE OF DYSAUDIA STUDENTS

As we all know, the disabled, a disadvantaged group in society, suffer from a feeling of inferiority to a greater or lesser extent both physically and psychologically .During teaching activities, teachers should be "disabled student-centered". According to this idea, the teacher selects appropriate teaching methods with physiological characteristics of the dysaudia student to teach. The key point is to mobilize the interest of the student. In the process of CSCL, teachers stimulate the interest of dysaudia learners at a high level and inspire them to take the initiative to solve problems. Upon completion of the CSCL mandate, teachers can help them find the self-confidence to make their life colorful.

3. PROMOTING COLLABORATION AND IMPROVING TEAM SPIRIT

For those students to be able to have a foothold in society it is necessary to engender their cooperation ability. The application of CSCL in university for disabled groups can meet the need in some degree. During this process, dysaudia students complete learning tasks through collaborative activities, and participate in exchanging with group members or teachers. Through solving study problems, these students understand the importance and necessity of collaborative and are enhanced collaboration ability, independent thinking skills and self-confidence. In this process, they can also improve their social skills and team spirit.

II. CSCL LEARNING PLATFORM STRUCTURE AND FUNCTION MODULES

Based on the above analysis of the dysaudia students, we designed a CSCL platform to help the dysaudia students learning.

1. SYSTEM REQUIREMENTS ANALYSIS AND MODULE DESIGN

We must consider the needs of special education learners themselves and the needs of professional disciplines related to the contents of the special education.

(1)Authentification

In order to help teachers arrange students, each learner is required to register, to acquire an account number, and to input his or her general information while logging in the system for the first time.

(2)Arrangement of learning task

Teachers set a task for learners. Learners start learning and discussing under teachers' guidance.

(3)Cooperative Discussion

Learners begin their study collaboratively; they communicate with others and get involved in group discussion on the CSCL instructional platform.

(4)Homework Submission

The CSCL instructional platform provides numerous functions for learners and teachers. For instance, learners are allowed to submit their homework, check the submission status as well as the results online at

any time; teachers are also able to make online evaluations.

(5)Assessment

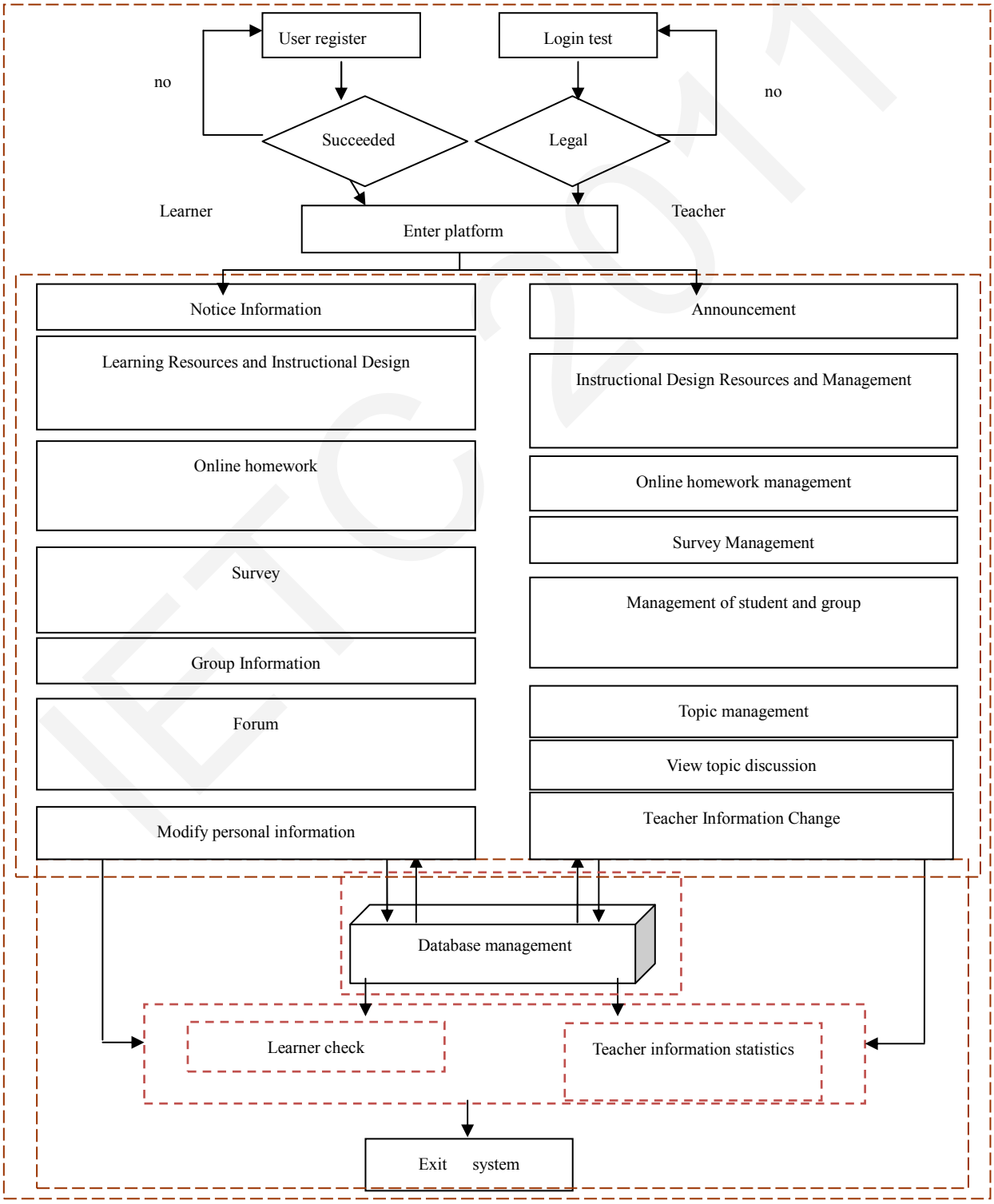
Teachers are able to give correct guidance to improve the learner's development according to each group's learning achievements.

(6)User Management

Based on the practical instructional condition, teachers can add new users or delete invalid accounts so as to maintain teaching safety as well as the fluency of the teaching process.

2. CSCL TEACHING PLATFORM MODULES

According to above functional requirements analysis, the platform modules are divided as follows:



III.THE TEACHING IMPLEMENTATION PROCESS ——BASED ON THE COURSE *GRAPHIC DESIGN*

1. THE TEACHING OBJECT ANALYSIS

Our practice research object is based on the Special Education College of Changchun University, China. The major is art and design for undergraduate students, and the classes are designated by the number 09403 and 09404.The students select one of two classes in the compulsory course *Graphic Design*, which is a practical skills course open to students with an art-design specialty. All these students have hearing impairment, only a few can do simple language exchange with incompetents.

2. CSCL TEACHING PREPARATION

(1)Dysaudia Students' Analysis

In order to put CSCL teaching smoothly into practice, to grasp the learners' cognitive beginning capability accurately, to know their computer skills and attitudes of using CSCL, we conducted an investigation of our teaching. Through questionnaires, we learned dysaudia students' degree of understanding and expectations for the CSCL teaching method, awareness and interest level for *Graphic Design*, etc.

(2)Planning Collaborative Learning Target

The learning target demands dysaudia students acquire the skill of using filter tools in *Graphic Design*. Through team learning, we expect to train dysaudia students in design and operation skills, cultivate students' independent thinking capacity, cooperative spirit and social skills in the process of completing the task.

(3)Learning Tasks Identifying

According to the characteristics of CSCL, we used learning of filters as a learning task, because this task has certain decomposability, and certain complexities. According to the actual situation, students can divide the task into background, font, and filter, which is helpful for collaborative learning.

(4)Grouping Strategy

The teachers established the student's beginning ability through statistical investigation data, and the results showed that there is a small difference between the two classes with regard to their initial starting capability. We chose the original placement, selecting the 09403 class as the control group, and 09404 class as the test group. The teacher divided students (09404) into four groups.

(5)Learning Resources Preparation

According to the teaching content, the teacher uploaded learning resources of *Graphic Design* to the CSCL teaching platform. Learning resources mainly included teaching documents, pictures, etc. The teacher used a username, logged into the collaborative learning platform and updated the latest study announcement. The teacher uploaded the course and the image of *Filters Use* to teach about database; these resources are visible in the learning resource list. The teacher used the information release system to release. Students downloaded the pictures and learning courses used to complete the study task in the repository of the collaborative learning resource list, and then viewed the content of teaching design detailed.

3. IMPLEMENTATION OF COLLABORATIVE LEARNING PROCESS

CSCL teaching practice includes guidance announcement, group collaboration learning, exchange of learning and results display.

(1) Guidance Announcement

Firstly, teachers will give brief introduction about the objective of the course, explain the function of

each tool, and show the possible results. The topic published in the platform allows students access to a cooperative group; teachers answer students questions in a timely manner to monitor student collaborative learning process.

(2)Group Collaboration Learning

①Into the Platform

Teachers and students can obtain their account number and password by registering the system. Each of the students was registered for each user name.

②View Group Situation and Task Allocation

After the distribution, the students entered the group area and checked their team members' information, and then members researched and exchanged ideas according to the learning task until they finish their respective task.

③Collaborative Learning

Each group member is responsible for part of the learning task. Understanding of different members of the task is not exactly same; the various viewpoints can be complementary to the successful completion of learning tasks. In addition, the discussion in the group is classified, and cannot be shared .In the collaborative process, teachers will do their best to answer questions and guide learners to complete learning tasks.

(3)Handing in Assignment

After the learning assignment, learners uploaded their works to the CSCL platform to show the results and waited for teachers to evaluate the completion of tasks.

(4) Evaluation

①Group Evaluation

The effects of cooperative learning evaluation can be produced through collective discussion. The members of the group can further deepen their understanding of the course. Each group needs to prepare the corresponding materials for the presentation and then complete presentations on the platform before group evaluation. During the presentation process, members of the other teams can ask questions and the exhibitors should give answers. According to display and response results, then other groups will give the evaluations. The counseling teacher should control the process and summarize the advantages and disadvantages of each group.

②Teacher Evaluation

The teacher's evaluation means that the teacher makes an appropriate assessment of the students' work and group status. On the platform, in order to check the students' homework, the teacher selects the title of the homework in the homework approval management section. After that, the teacher should then make recommendations and choose the best homework example. Based on the learning results of each study and each group, the performance of team members, the instructors give the evaluation to the students and guide them on how to develop better.

IV. CONCLUSION

After eight weeks of experiment, we conclude that:

1. Collaborative learning can enhance interactions between teachers and students and eliminate the barriers of language communication.

2. Collaborative learning can promote comprehensive physical, mental and skill development of these students. It can also improve problem-solving skills, computer skills, professional skills and social skills

during the process of analyzing and solving problems.

3. The CSCL learning platform provides spaces for collective displaying of dysaudia students' homework.

This study focuses on the practice of high special education based on CSCL, fully mobilizes the learning and mastering of learning enthusiasm of dysaudia students, enhances team spirit during the learning process, along with communication skills, collaboration skills, responsibility, self-confidence of the dysaudia students, changes the situation appearing in the traditional class and provides an effective way to improve the learning efficiency of these students.

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INTEGRATING WEB 2.0 TECHNOLOGY INTO AN ESP COURSE: A CASE STUDY OF USING FACEBOOK IN ENGLISH FOR BUSINESS COMMNUCAITON

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Abstract

This case study aimed to explore the effect of integrating Facebook and peer assessment in English for Business Communication course through a blended teaching approach. The subjects were 111 students from a technological university in Taiwan. The students were divided into three groups with three Facebook platforms. The mixed method consisting qualitative and quantitative approaches were administered to analyze the collected data in the study, including the pre-and post-tests, qualitative data of peer assessment on Facebook sites, and a self-developed semi-structured survey questionnaire. The findings of this study indicate that incorporating Facebook in English for Business Communication course can be effective for college students. Student can improve their professional knowledge not only from the in-class instruction but also through peer assessing on Facebook. In addition, the blended learning approach can significantly motivate the students' learning interest. Finally, the findings of this study may provide useful instructional strategies to ESP teachers of English for Business Communication course.

Keywords: blended learning, ESP, Facebook, peer assessment, Web 2.0 technology

INTRODUCTION

Under the constructivism paradigm, a learner acquires new knowledge through a process of initial self-motivated attempts and exploration of using existing knowledge (Lou, et al., 2011). Bruner (1990) also pointed out that students are encouraged to participate in active dialogues with other students and instructors as well as to collaborate with others in activities in order to construct knowledge and discover principles for themselves. Meanwhile, the rapid growth and development of Web 2.0 technology applications, in particular Facebook have made users and learners to interact and collaborate with each other actively in a virtual community. Nowadays, more than 500 million people are using Facebook to communicate, interact, and socialize with others synchronously and asynchronously. Up-to-date, not many studies investigated the effect of learning and teaching through Facebook in the tertiary education. Therefore, it is important to investigate the effect of incorporating web 2.0 technology with various teaching and learning strategies and approach for improving the quality of learning and teaching transaction.

LITERATURE REVIEW

Many studies indicated that team-based and project activities can merit active learning (Lang, 2010; Lou, et al, 2010; Neo, Neo, & Kwok, 2009). Additionally, functions such as emails, bulletin boards, chat rooms, and online discussions can also promote learner-instructor and learner-learner interactions in Internet instruction. Online learning utilizing with web technologies has become increasingly important and crucial for education (Jou, Chuang, & Wu, 2010). Knowledge sharing requires collaboration and cooperation between the interaction of the learners and contributors of knowledge. Thus, students are able to sustain the inter-relationship among the group members through effective group communications and discussions in such a cooperative learning environment (Yang & Chen, 2008). Thus, it is important for educators to understand students' backgrounds, attitudes, and learning needs toward both academic and social life in order to engage a cohort of students (McCarthy, 2010). Furthermore, according to So & Brush, 2008 and Shih, 2010, a blended learning, combining online learning with traditional face-to-face instruction can create a positive experience for both instructor and students as well as facilitate online collaborative learning. Thus, in order to explore how students' learning interests and their learning performance can be motivated and enhanced, this study employed a blended learning approach combining the traditional face-to-face teaching method, Facebook assisted learning, and peer assessment.

RESEARCH METHIOD

The mixed method was used in this study, consisting of pre- and post-test, content analysis of feedback and comments on Facebook sites, and a self-developed semi-structured course satisfaction survey questionnaire.

Research participants

The participants in this study were 111 students (48 males and 63 females) enrolled in an ESP course, English for Business Communication from a technological university in Taiwan. The participants were divided into three groups (college students, postgraduates of Industrial Management, and postgraduates of Business Administration). Each group operated one Facebook platform for conducting peer assessment on their weekly assignments.

Research Instruments

The pre-and post-tests, qualitative data of peer assessment on Facebook platforms, and a self-developed semi-structured survey were the research instruments in this study. The collected quantitative data were analyzed by SPSS descriptive analysis and factor analysis. Content analysis was used to analyze the peer comments on the three Facebook platforms. Figure 1 shows a webpage of the Facebook platform in the study.

Fig. 1: A webpage of Facebook platform for English for Business Communication course

The Learning Satisfaction Survey Questionnaire for English for Business Communication Course

In order to explore the students' learning satisfaction toward the Facebook integrated blended learning course and obtain further information from the students, a 5-point Likert semi-structured satisfaction survey questionnaire, consisting of demographical information and 32 closed-ended questions and 3 open-ended questions was developed by the researcher. The three open-ended questions used are as follows: (1) what do you think of the course arrangement and implementation of the integrated Facebook blended learning for English for Business Communication course? (2) what are the advantages and disadvantages of using Facebook to assist in learning English for Business Communication? and (3) what are the advantages and disadvantages of using peer assessment to learn English for Busienss Communication?

Research Procedures

The study lasted for 18 weeks (one semester) in 2010. The first 7 weeks of the semester were the traditional face-to-face instruction. From Week 9 to 17, a blended learning with Facebook was implemented. The post test and satisfaction survey were administered in the last week. The research procedures are illustrated in Figure 2.

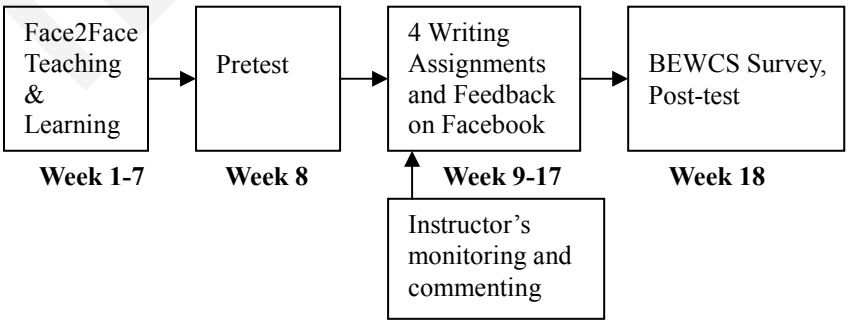

Fig. 2: The research procedures of the Facebook integrated blended learning for English for Business Communication

FINDINGS AND DISCUSSION

Results of the pre- and post-tests

According to the statistical results, the total average scores of the pre- and post-test were 48.04 and 85.73 respectively, indicating the students made significant progress on the English for Business Communication course.

Table 1: The Statistical Results of Pre- and Post-tests for the Three Groups

Department	Sex	test	N	Min.	Max.	Mean	SD
English Majored N=54	Male	Pretest	13	16.00	66.00	41.4615	17.30422
		Posttest	13	56.00	96.00	78.0000	12.11060
	Female	Pretest	41	20.00	82.00	53.7317	15.19543
		Posttest	41	60.00	100.00	88.7317	17.34218
Industrial Management N=35	Male	Pretest	27	20.00	68.00	45.6296	12.36978
		Posttest	27	58.00	100.00	85.4815	11.07447
	Female	Pretest	8	31.00	78.00	58.0000	17.72811
		Posttest	8	82.00	100.00	92.2500	5.89794
Business Admin. N=22	Male	Pretest	8	10.00	52.00	33.8750	13.37842
		Posttest	8	46.00	100.00	80.0000	18.14229
	Female	Pretest	14	18.00	72.00	44.5000	17.06887
		Posttest	14	56.00	100.00	84.1429	16.99709

Results of peer assessments on Facebook platforms

All group members were required to do 4 writing assignments and post them on the Facebook platform. Afterwards, group members had to review and comment on others' works. Content analysis was employed to analyze the three group students' comments and feedback on the Facebook platforms. According to Table 2, the students of Master program of Business Administration made the most comments and feedback on their peers' postings. The English majored students made the least comments and feedback comparing with the other two groups.

Table 2: Statistical Information of content analysis on the three Facebook platforms

Group	Number of Students made comments	Number of comments made	Number of "like" being sent
English-majored	26	44	1
Master of Business Admin.	22	98	12
Master of Industrial Management	32	53	32

The results of content analysis show that the comments on peers' work from the students of the three

groups were mainly about grammatical errors, such as tense, spelling, and structure.

Results of the English for Business Communication Learning Survey Questionnaire

The satisfaction survey questionnaire obtained .963 of Cronbach's Alpha Coefficient, indicating the survey questionnaire has obtained a high level of consistent reliability. In order to further investigate the factors that influenced the students' Facebook integrated blended learning, the exploratory factor analysis was employed. Based on the literature review and the types of questions, the five factors extracted from the survey questionnaire were categorized into 1) course arrangement and implementation, 2) use of digital learning platform (Facebook), 3) interpersonal relationship, 4) English for Business Communication learning, and 5) the fulfillment of learning.

Additionally, the statistical results of descriptive analysis on the responses to the survey questionnaire show that the 32 questions obtained mean scores ranging from 3.8462 to 4.3365 and only five items obtained mean score below 4.00, indicating the students highly agreed on that statements of the questionnaire. In other words, the students agreed that Facebook integrated blended learning for English for Business Communication course was very effective, interesting, and satisfying.

CONCLUSION AND SUGGESTIONS

This study was aimed to explore the effect of incorporating Facebook with blended learning for three different majored and level of students in an English for Business Communication course. The findings of the study showed that the graduate students of MBA program made the most comments comparing with the English majored students and graduate students of Industrial Management program. The reason could be because the course was directly related to their major and future career, although this course was a required course and primarily provided to English majored students. With this regard, the future study may focus on investigating the factors that influence the students' learning motivation and desire. Additionally, using peer assessment on Facebook to assist students in learning English for Business Communication can be an effective way for students to improve their grammar skills such as tense and sentence structure, etc as well as to enhance their learning desire of a such difficult professional subject.

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Integration of Health Media to Increase Knowledge and Attitude of Healthcare of People in Southern Border Provinces

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Abstract: From the unrest situation in Southern border provinces (SBP), the people could not understand, access and participate public health services. Moreover, they lacked of knowledge, understanding in appropriate health behaviors and health media. In the present time, mass media; especially person media, health personnel and religion leader played roles in building knowledge and attitude in behavioral change. The **objectives** of this study was to produce and develop offensive integrative health media, health promoting networks in target groups: aging male and menopausal, aged persons, health personnel and village health volunteers; to test and evaluate offensive integrative health media to develop body of knowledge, understanding and good attitude to self health care; to deliver health media to local health organizations and mass media to contribute knowledge for self care, including the campaign, speeding up and public relations to target people; to built knowledge, understanding and awareness of health care, and to disseminate, give public relations of governmental news to local people, to build their images and understanding between governmental organization and people. **The research instruments composed of the** designed and produced integrative media by using ADDIE process and try out for effectiveness. Follow up the effect of media for each target group by analysis of questionnaires of people from 4 SBP of 3,346 and in-depth interview in 7 groups of 36 people. Collective data of needs of people, advices of health experts and mass media for database in production of integrative health media were conducted. **The results** from the assessment of health media needs showed that the most appropriate media was television. The others were radio and medical doctors. Most of people need lectures and additional health checks up after the media exposure. Furthermore, the integrative health media of 10 common diseases of aging people in SBP were produced for television showed as "3 minutes-good health-no buying or selling" in 100 topics, "Good health-no buying or selling" for 25 minutes in 30 sections, poster and brochures in 5 types each, and handbook for people. These made the people understand the content of prevention and treatment for the disease more effectively. In **conclusions,** the appropriate types of health media in SBP should be television, radio, and publication media; including electronic media which were short, easy content, more frequent with attention of identity and equity. The integrative health media made the target groups understand the contents of the diseases, prevention, health care and steps of treatment. There should be continuous production and distribution of health media for health care, understanding of health problems, receiving people's opinion and public relations of governmental media to people in all of local areas; to make images and understanding between health governmental organizations and people. The offensive health units would support there should be additional production of integrative health media and social media. The media should be distributed and increased channels of dissemination, e.g. health roads, peace roads, in cooperation with district or provincial administrative organizations in the areas and related organizations, people, religion leaders. These would create health, peace and quality of life of people and government officials in SBP.

Keywords: Aging male and menopause, Health promotion, Health media, Health communication.

Introduction

1. Importance and origin of the problem

1.1 In the present time, the roles of media are accepted to influence behavioral change of people, especially health media which health personal used to empower people. Health professional persons believe that the empowerments with health media will facilitate the behavioral change to self-care, which will develop personal health status, help each other and their facilities to distribute health knowledge to build strong communities. For each person need to know health and practice under teaching and guidance of health team. In this case, health media have roles in development of knowledge and correct self health care. From Suan Dusit Poll survey of people opinion, radio is the second popular media to TV but can be distributed to all audiences. Therefore, the distribution of health knowledge by radio is efficient and cheap and the people can receive health news from every region easily and quickly.

1.2 The development of efficient media responds to the solution of health problems of aging men and women and aged people promptly. It should be sure that the produced media has potential enough to distribute to target group efficiently and build their knowledge. There should be checking and experimenting for the master media for correction of mistakes and develop to maximum efficiency. The testing of media must integrate each media into the system. The effect of complete integration will affect better quality of life of aging and aged people. Furthermore, the result of experiment will be the prototype in the production of health media and other media.

1.3 From the research of health media for promoting quality of life of people in 3 Southern bordered provinces (SBP) by Sayan Sawatsri and colleagues. It was concluded that health media in this area should use local languages in opening and closing the program, access to Muslim's way of life, the media must integrate in the diversities and the channel that the people can access are TV, radio and person media. The media should be short, easy. The frequency of distribution of health media should be frequent. The interested topics are urinary tract diseases, brain diseases, and the diseases of aging and aged persons. There should be distribution of handbooks, pamphlets, posters, and health education, etc., to local health district offices to distribute to people with emphasis of participation of health networks and mass media of government, private and public sectors.

1.4 The using of information technology in service will bring the feedback data of quality of services, e.g., the health result of the attendee both for physical and mental health, the expenditures and access to health services. This brings to data for determination of health policy for SBP in the future.

2. Objectives

2.1 To produce and develop integrative health media, health promotion networks in target population, e.g., aging men and women and aged people, including health personnel and health volunteers in SBP villages.

2.2 To test and evaluate the efficiency of offensive integrative health media to develop good knowledge, understanding and attitude in healthcare.

2.3 To deliver produced health media to health organizations, and mass media in the specified areas to distribute knowledge in self-healthcare, including campaign, accelerate in public relations to target population to gain knowledge, understanding and awareness of healthcare.

2.4 To distribute public relations of governmental news to people in specified areas to make good image and understanding among health organizations, government organizations and people.

3. Scope of research

This research had conducted under this scope:

3.1 In the media production and development the integrative health media composed of TV media, and publication as posters, pamphlets, and handbooks in health care by using public relations networks.

3.2 The produced media distribution would be used by the medical doctors, nurses, health personnel, mass media, people and community leader in SBP by means of newspapers, electronic media and training, to transfer good knowledge and attitude in health promotion and healthcare of people and government personnel in SBP.

3.3 Health media was evaluated and analyzed the efficiency in development of knowledge, understanding and use them for prototype in the production of other media.

3.4 Health media would be used under the organize meeting for building aging and aged people networks in SBP.

4. Benefits of research

4.1 Gaining the guide for the development of integrated health media for stability and gain media with quality in responsible to health problems and needs people in SBP areas.

4.2 Gaining knowledge with potential and positive attitude in self-healthcare from various appropriate health media for strong communities.

4.3 Target groups could receive health media with quality and appropriate guidelines and practice to bring positive attitude towards health promotion and rehabilitation.

4.4 Public relations network for development of health promotion was built with the disease prevention treatment and rehabilitation of people and officials both inside-outside of 3 SBP areas to ensure fair and equitable and distribute government information to people in the area thoroughly.

4.5 People were empowered to increase their health knowledge from health professional persons and various mixed health media according to popularity or availability in SBP area.

4.6 Health care activities were cooperated from health networks, people, soldiers, academicians, mass media and religious leaders by using integrative health media to join in right and real understanding.

5. Definition

5.1 Aging men and women means men aged 40-59 years and women aged 45-59 years.

5.2 Aged persons means men and women aged 60 years or more.

5.3 Health promotion means the process of healthcare of the persons who are not ill and slightly ill, stressing on basic health services for promoting health, preventing diseases to self healthcare in daily life in all aspects of health, e.g. physical, mental and environmental health for the results of better quality of life, well-being and good health.

5.4 Health media means health technology to increase the potential in knowledge, attitude and elementary self-healthcare as follows:

5.4.1 Network media, e.g., radio, TV

5.4.2 Printed media, e.g., textbook, poster, pamphlet, brochure, articles

5.4.3 Electronic media, e.g., website, e-mail

5.5 Health communication means the communication process which comprises senders, channels and receiver, stressing in communicating health data, including analysis of barriers and distortion of right understanding associated with health.

Research methodology

The research on Integration of Health Media to Increase Knowledge and Attitude of Healthcare of People in Southern Bordered Provinces is an applied research which is operation research.

1. Steps of research

1.1 **Research design**; design and produce various types of media by ADDIE process model and test for effectiveness, monitor the use of each media with target group by analysis of documents, questionnaire and in-depth interview.

1.2 Determination of sample size

1.2.1 **Population and sample**

Population The population composed of two groups as follow;

Group 1: People who stayed in Narathiwat, Pattani, Yala, and 4 districts of lower Songkla(Sabayoi, Thepa, Chana and Nathawi) 6 months and longer in fiscal year 2008.

Group 2: Government official, mass media, community leaders, soldiers aged 40 years and above who stayed in Narathiwat, Pattani, Yala, and 4 districts of lower Songkla 6 months and longer.

Research Sample

Group 1: People aged 40 years and above in SBP, using Yamane's formula at 95% confidence level in the survey with questionnaire. There were 1,600 persons in this group classified by areas and religions..

Group 2: Health personnel government official, mass media, community leaders and soldiers were purposive sampling by volunteer to expose the

media then participated by in-depth interview. There were 369 persons in this group.

1.2.2 **Sample selection**: using multi-stage random sampling

1.3 **Data collection** This research gathered data as follow:

1.3.1 Ask for permission of the specified organization

1.3.2 Sample selection: classified by specified conditions

1.3.3 Develop questionnaire as research tools and evaluate the quality of research tool

1.3.4 Cooperate with the local organizations before sending the questionnaire for data collection

1.3.5 Send evaluation forms to local researchers, e.g., Songklanagarind University, Pattani campus to collect data, evaluate the data and send the data to Aging Male Clinic, Phramongkutklao(PMK) Hospital and Department of Educational Technology, Faculty of Education, Kasetsart University.

Conclusion of the samples

1. People aged 40 years and above: 1,600 persons, classified by areas and religions.
2. Health personnel, government officials, mass media, religion leaders, community leaders, soldiers: around 369 persons for in-depth interview.

Research Methodology

2.1 Meeting for project planning

2.1.1 Meeting with associated local personnel and set educational plan. Plan and manage the project, public relations by using media, e.g., posters, pamphlets and TV.

2.1.2 Meeting with research team and personnel that were responsible for production, testing and evaluation of media, type of media and using of integrative health media.

2.2 **Testing of sample of integrative health media for aging people**, including video for health promotion, posters, pamphlets and handbooks by experts in contacts, techniques and validity evaluation and appropriateness for media presentation for appropriate areas and target group.

2.2.1 **Design and produce** on TV program, electronic media and printed media according to specified types.

1) Steps in media production consists of analyze health problem of people in 4SBP and specify the issues to present in each type of media.

In case of the media planning, the planning process specifically use by ADDIE MODEL

A = Analysis: analyze the problems and context of people in 4 SBP, analyze common diseases, method of health promotion and prevention, analyze content and types of media to distribute knowledge and analyze types of media for presentation.

D = Design: design types of appropriate media to the specified objectives, pamphlets, posters, video 3 minutes and 30 minutes.

D = Development: conduct the production of media according the specified steps.

I = Implementation: evaluate the media by experts and test it with the real target group.

E = evaluate the media and improve them.

2) Production of integrative health media, classified by types

1. **Health promotion TV** Program showed by Aging Male Clinic of PMK Hospital, Royal Thai Army Medical Department, Department of OB-GYN of Faculty of Medicine, Songklanakarin University, Hadyai campus, joining with Royal Thai Army classified to 2 programs

-Three minutes health without Buying/ Selling TV program, broadcast for every Wednesday, Thursday and Friday, 05.15-05.20 from TV 5/1 Pattani, 100 programmed.

- Health without Buying/Selling TV program for people aged 40 years and above:30 minutes per week form TV 5/1 Pattani, 30 programmed.

2. **Posters and pamphlets** series "Prevention and treatment of common 10 diseases of aging people" 5/ type
3. **Handbook** of Health without Buying/Selling No.5 sections 10 common diseases in aging persons in SBP.

2.2.2 **Test of health media** with target group in SBP, test of efficiency of media, survey of satisfaction and result of learning from media by questionnaire and in-depth interview.

2.2.3 **Evaluation of integrative health media**; video of health promotion and healthcare 3 minutes, 30 parts and 30 minutes, 10 parts, pamphlets and poster each 5 stories, only 1 handbook of Health without Buying/Selling No.5, by questionnaire, in-depth interview and conclude the operation.

1) Opinion survey by closed and questionnaire for health personal and soldiers.
2) In-depth interview divided 7 groups totals 369 peoples

2.2.4 **Data Analysis** obtained from the experiments by using percentage, mean, and conclusion the result of analysis.

2.3 **Meeting of operation for doctor**, health personnel and mass media, and training for health personnel in health centers as well as people, officials, soldiers, mass media in the areas, 2 times/year for exchange knowledge and experience in treatment and rehabilitation.

2.4 **Location of operation / Data collection**

Production of health media at Aging Male Clinic, PMK Hospital, develop and design prototype of media at Department of Education Technology, Faculty of Education, Kasetsart University and collecting data from questionnaires in SBP, at Songklanagarind University, Pattani Campus, Yala Hospital , Pattani Hospital, Narathiwatratchanagarind Hospital and Chulabhorn Camp.

2.5 Data analysis

Analyze by using computer programs for percentages, maximum, minimum and Chi-square.

Research Result

The numbers of male samples were more than female ones. Most of them aged 41-50 years, and 31-40 years, respectively. Most of their occupations are teachers and agriculturists, respectively. Most of their religions were Buddhism and Islam, respectively. Most of their marital statuses were married and single, respectively. Other statuses were religious leaders. Most of their personal health problems were headache, joint pain and hyperlipidemia, respectively.

Every media had average scores in high level; 25 minute video media had highest average scores. It was found that pamphlets and 25 minute video media had highest scores in the issue of good transferring of disease concept, quick understanding, content coverage, including appropriate size and type of alphabet. It was found that 25 minute video had highest average scores; poster had high average scores in the issues of appropriate color and pictures.

People in 4 SBP perceived media in the topics of healthcare from 25 minute video media higher than poster significantly ($p< 0.05$). They had continued ways of self healthcare from pamphlets higher than poster significantly ($p< 0.05$). For other issues, they thought indifferently.

Both 3 minute and 25 minute video media had high average scores in every issue. It was found that 25 minute video had highest in the issues of knowledge perception. For the issues of attitude to media and ways of practice, it was found that pamphlets had highest average scores. 3 minute video had highest average scores in the issues of benefit from media and effect to community and localities. After the testing for difference among groups, it was found that there was no difference significantly ($p< 0.05$). It showed that although different religion, but people thought about effect of poster using indifferently.

For the knowledge from media, Songklanagarind University, Pattani Campus and Yala thought that poster gave knowledge higher than Narathiwat significantly ($p< 0.05$). For the attitude to poster, Songklanagarind University, Pattani Campus and Yala had attitude to poster higher than Narathiwat significantly ($p< 0.05$), and Pattani higher than Songkla significantly ($p< 0.05$). For ways of practice significantly ($p< 0.05$), Songklanagarind University, Pattani Campus and Yala thought that thought that poster gave ways of practice higher than Narathiwat significantly ($p< 0.05$). For the benefit from media, Pattani thought that poster gave benefit higher than Narathiwat significantly ($p< 0.05$). For the effect to community and localities, Pattani thought that poster had effect to community and localities higher than Songkla and Narathiwat significantly ($p< 0.05$).

The opinion of islams to effect of pamphlet media was higher than Buddhists significantly ($p< 0.05$). For the knowledge from media, Songklanagarind University and Pattani thought that pamphlets give knowledge higher than Narathiwat significantly ($p< 0.05$). For the opinion to media, Pattani thought had opinion to pamphlet higher than Songklanagarind University Narathiwat and Songkla significantly($p< 0.05$) and Yala more than Narathiwat significantly($p< 0.05$). For the practice, Songklanagarind University concluded that Pamphlet was better in practice than Narathiwat significantly ($p< 0.05$) and Pattani higher than Songkla and Narathiwat significantly ($p< 0.05$). For the benefit of media, Pattani concluded that pamphlet was more useful than Narathiwat and Songkla significantly ($p< 0.05$). For the effect to community, Pattani and Songklanagarind University concluded that pamphlet had more benefit than Narathiwat significantly ($p< 0.05$).

Islamic people thought that the result of 3 minute video media was more than Buddhist people significantly ($p< 0.05$). For the knowledge from media, Songklanagarind University thought that 3 minute video give knowledge more than Narathiwat and Songkla significantly ($p< 0.05$). Islamic people thought that the result of 3 minute video was higher than Buddhist people significantly ($p< 0.05$).

Islamic people thought that the result of 25 min video was higher than Buddhist people significantly ($p< 0.05$). For the knowledge from media, Songklanagarind University thought that 25 min video was higher than Pattani, Narathiwat and Yala significantly ($p< 0.05$). For the effect to community and localities, Songklanagarind University thought that 25 minute video had effect to community and localities higher than Narathiwat, Songkla and Yala significantly ($p< 0.05$).

Conclusions and Discussions

Conclusions: The appropriate types of health media in SBP should be television, radio, document media; including electronic media which were short, easy content, more frequent with attention of identity and equity. The integrative health media made the target groups understand the contents of the diseases, prevention, health care and steps of treatment. There should be continuous production and distribution of health media for health care, understanding of health problems, receiving people's opinion and public relations of governmental media to people in all of local areas; to make images and understanding between health governmental organizations and people. The offensive health units would support the distribution of health media by providing channels for health media.

Discussions: There should be additional production of integrative health media and social media. The media should be distributed and increased channels of dissemination, e.g. health roads, peace roads, in cooperation with district or provincial administrative organizations in the areas and related organizations, people, religion leaders. These would create health, peace and quality of life of people and government officials in SBP.

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INTEGRATION OF TECHNOLOGY INTO ADULT ESL CLASSES IN TURKEY: ADULT ESL STUDENTS' AND ESL TEACHERS' PERCEPTIONS ABOUT IMPLEMENTATION OF ICT IN ONE ENGLISH PREPARATORY SCHOOL (FDY) IN ISTANBUL

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Abstract
The purpose of this study is to develop a new perspective on English as a Second Language (ESL) education through bridging andragogy with technology under the umbrella of constructivist pedagogy. The example of instructional methods chosen at a private university in Turkey, together with ESL students' and ESL teachers' perceptions about the implementation and impact of information and communication technologies (ICT) in the Turkish educational system, suggests a theoretical framework for further implementation of learning and teaching in bilingual settings. This is a need particularly evident in a developing country like Turkey that is working to acquire 21st century literacies in educational technologies.

Key Words: andragogy, constructivist pedagogy, ESL students' and ESL teachers' perceptions, ICT, learning and teaching in bilingual settings, 21st century literacies, educational technologies.

INTRODUCTION

This paper elucidates the way the process of adult education (andragogy) used with older adolescents (18-22), in conjunction with emerging technologies, can provide a successful model for ESL education in a wider context. The study draws upon the literature, theory and practice of the field, as well as interviews, direct classroom observations, and data collection through survey. The study suggests that teachers' technological implementations in the classroom can be a powerful means to help students acquire a new language and to become more adult, self-directed, and confident learners. Since the ESL learners were in a transitional age period from adolescence to adulthood, andragogy was an essential constituent in class applications, and ICT played a significant role to help students become adult learners. Evidence drawn from the literature review demonstrates that ICT is a growing phenomenon in various specialties in the Turkish educational system. However, very little research has been done on the impact of ICT on second language acquisition, particularly in ESL classes. This study thus addresses a gap in the bilingual learning/teaching literature and develops a hypothesis about the convergence of theory and practice.

BLEND OF ART AND SCIENCE: FROM THEORY TO PRACTICE

A goal of this study is not to reject the pedagogical view within the theory of education, but to conceptualize an instructional model that blends constructivist pedagogy with andragogy, a theory of adult learning, and to show how ICT can be a major catalyst to enhance the power of both approaches. The model is holistic and student-centered. The teacher acts to blend the constructivist pedagogy with an alternative instructional theory: andragogy. In other words, this study is a blend of art and science through a holistic approach where the teacher still acts as a "facilitator", "guide," "leader," and a "problem solver" (Cohen, 1994). Stated in another way, the conceptual framework relies on an andragogical approach within the constructivist discipline, and the emerging technologies applied underscore the new model in adult ESL classrooms. By definition, adult learning theory, *andragogy* (Knowles, 1950), connects with constructivist pedagogy (Piaget, 1967) with learning/teaching practices that focus on adult ESL learners rather than younger ESL students. According to Knowles (1977), andragogy includes four assumptions related to: 1) self concept; 2) experience; 3) readiness to learn; and 4) orientation to learning. Democratic participation is also another component. The *blended unified design* (BUD) hypothesized for this study demonstrates the usefulness of a blended approach that includes both constructivist pedagogy, andragogy, and the kinds of holistic practices that can be exemplars in both areas.

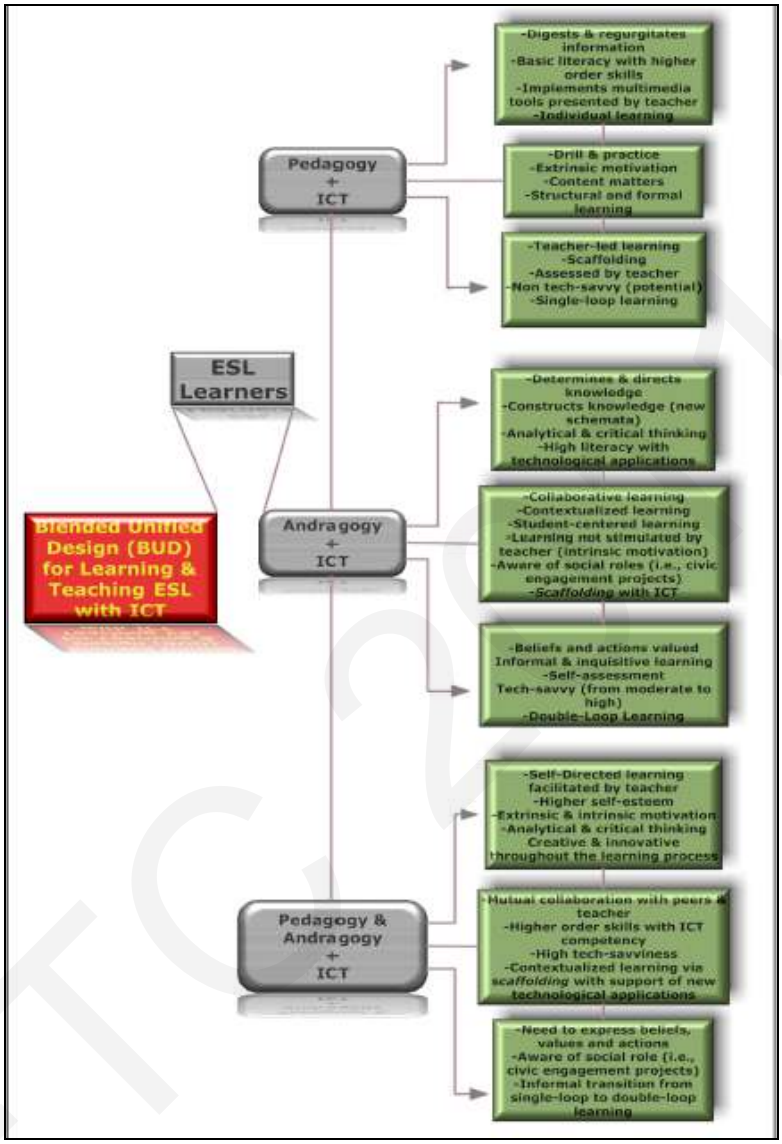


Figure 1. Blended Unified Design (BUD) for Learning/Teaching Adult ESL Classrooms. The figure presents how various courseware such as *Quia*, *Lextutor*, and *Nicenet ICA*, etc. are practiced by ESL learners first pedagogically (constructivist), next andragogically, and finally together.

METHODOLOGY

The methodology of the study at FDY involves the following components:

• A focus on specific software applications such as *Quia, Lextutor, Nicenet ICA,* and more;

• Interviews with school administrators to determine the level of school support, attitudes, and their impact on ICT implementation in ESL classes;

• A triangular method of data collection that included interviews of students, teachers, and administrators; in-class observations; and survey data collected from students to explore general perceptions about the utility and potential

benefits of ICT practices in class. This combined approach to data collection helped generate findings that form the basis for a new hypothesis, the *blended unified design* (BUD) of learning/teaching ESL with ICT.

I used *triangulation method* for data collection. The multiple sources would "give my conclusions far more credibility than if I had been limited to one source or method" (Maxwell, 2005, p. 94). These three sources of data
included: 1) interviews with adult ESL students, ESL teachers and school administrators; 2) in-class observations; and 3) an online survey about ICT implementation in adult ESL classes. These research instruments were designed to address two core questions and one secondary research question listed below:

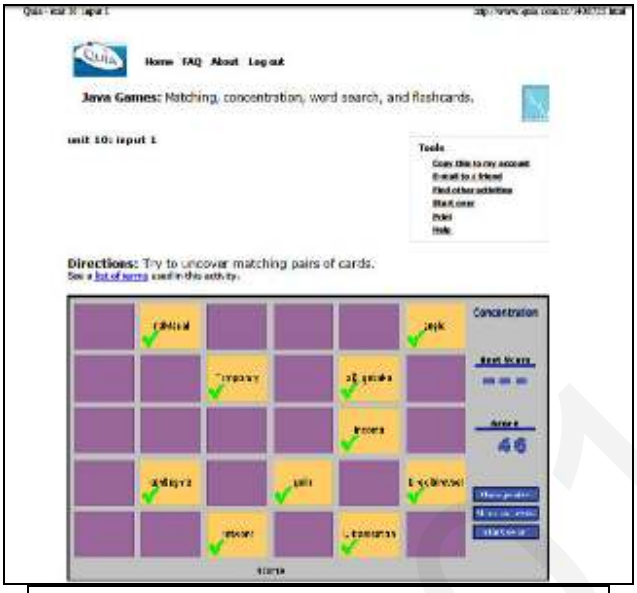
1. How do adult ESL students find the implementation of ICT in their classes as a key component of their learning English?
2. In what ways do ESL teachers see the implementation of technology in their classes beneficial to create *meaningful* and *self-directed learning* for students?
3. In what ways does the school structure conceive ICT resources a key part of adult ESL learning/teaching?

The site for the study was one private university, Sabanci in Istanbul, Turkey. I intended to demonstrate the onsite implementation of ICT in adult ESL classes which might exemplify both constructivist pedagogy and andragogy. Since Sabanci is a leading English preparatory school in Turkey, I thought that the School of Languages (SL) there would let me test both the effectiveness of educational technologies in adult ESL classes and their impact on instructional methods and learning settings. SU is one of Turkey's most prominent educational institutions. It includes a Foundation Development Program (FDP) intended to help students acquire full mastery in English via cutting-edge technologies and engagement in civic projects with the goal of becoming ideal citizens. The program is designed for young adult learners (18-22), a time before they are eligible for various majors across the university's faculties. My criteria for choosing FDY included: 1) sufficient technological resources; 2) the school's awareness of the benefits of technology in meaningful adult ESL learning; 3) professional staff competent with new technologies; 4) a wide array of adult ESL students from traditional to tech-savvy; 5) openness to constructivist studies (i.e., institutional support); and 6) openness to learning (i.e., pre-service and in-service teacher training).

PARTICIPANT SELECTION: INTERVIEWS

This study used a *purposeful selection.* Purposeful selection refers to "a strategy in which particular settings, persons or activities are selected deliberately in order to provide information that can't be gotten as well as from other choices" (Maxwell, 2005, p. 88). My study included nine interviewees and eighty-one respondents to the online survey in total. The student and teacher interviewees were chosen based on *homogeneity*, the administrators were randomly chosen, with groups composed as follows:
• ESL students (Two male, one female)
• ESL teachers (Two female, one male)
• School administrators (Three male)

The student interview sample was *homogeneous* because all ESL students were involved in upper-intermediate classes at SU, FDY, preparing to take the English Language Assessment Exam (ELAE) at the beginning of September. They were using the same types of technologies (*Quia*, *Lextutor*, *Nicenet ICA*, and more).



The second participant group interviewed was ESL teachers at the SL, one male and two females. They, too, were a homogeneous group since they all taught in upper-intermediate classes and were preparing students for the ELAE. I had no prior knowledge of the participants, or their in-class practices with ICT. Gender rationale in the selection of teachers was crucial because I was trying to refute the common belief that female ESL teachers might have a negative approach toward technologies. I therefore decided to analyze the tech-savviness of the FDY female teachers. The three school administrators were chosen at random according to their specialization with these technologies. They all had large areas of responsibility; the university president in the managerial operations of the entire university, the IT administrator in all systems operations and other technological support (i.e., software and hardware allocation and trainings), and the HR administrator in all human resources operations (i.e., recruitment, Intranet correspondence with students and faculty members, program orientations, pre-service and in-service teacher training, etc.).

ESL STUDENT INTERVIEWS

The ultimate aim here was to elicit students' perceptions about technology integration in ESL classrooms. I asked technology-related questions such as:

• Which ESL courseware did you use in the class to improve your English skills: listening, vocabulary, academic writing, reading, and speaking skills?
• In what ways did your ESL teacher use *Quia* in your class?
• To what extent did your ESL teacher use *Nicenet ICA* in the class? How?
• How did your ESL teacher use *Lextutor* in the class?
• Which software programs did you use for research? How?
• Did you use *podcasts* in the class? How?
• What was the impact of technology on your learning ESL?
• How do you assess your teacher's implementation of technological applications when you think about her/his attitude(s) toward ICT?
• Did you learn English better from your female or male teacher?

These interviews were semi-structured and in-depth. Each interview was held individually and in an informal setting. There was also a separate discussion group at the multimedia lab, where we talked informally about the implementation and the effectiveness of ICT in the ESL students' learning process.

ESL TEACHER INTERVIEWS

The purpose of interviewing ESL teachers was to understand their use of courseware such as *Quia*, *Lextutor* and *Nicenet ICA* in class. I was particularly interested in female teachers' approaches to and beliefs about technology and wanted to explore possible gender differences in ICT implementation. In order to understand teachers' perceptions about the use of educational technologies, I asked the following questions:

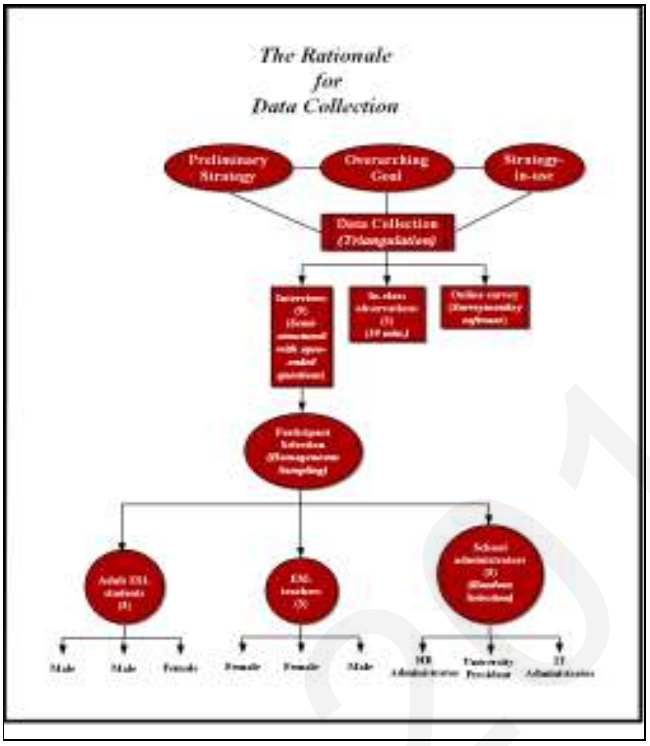
• How do you evaluate your own instructional methods as an ESL teacher?
• What do you think about your colleagues' ICT applications in the classroom?
• How do you evaluate the extent to which your male students and female students learn English? Do girls learn ESL better with technology, or is boys' ESL learning with ICT better than that of girls'?

SCHOOL ADMINISTRATOR INTERVIEWS

The third group of participants was a randomly chosen group that included the Sabanci university president, and the administrators from Human Resources (HR) and Information Technology (IT). My goal in these interviews was to explore school support for ICT implementation at the university and in particular at the SL. I aimed at understanding the extent to which the SU administration allocates technical resources (i.e., software tools and hardware) in instructional practices. My focus was on school support for teaching with technologies during FDY at the SL. These interviews, too, were semi-structured and conducted in an informal setting.

DATA COLLECTION RATIONALE

Each group interviewed for this small-scale study thus provided a different perspective and a different kind of learning, all of which contributed to a salient data analysis. No interviews, in-class observations, or personal communications were held without the permission of the participants. The participant selection allowed for a full exploration of the perceptions about ICT implementation. IT (Information Technology) Department at Sabanci University is also called BT Departmani (Bilgi Teknolojisi) Departmani in Turkish in adult ESL classrooms at SU.



IN-CLASS OBSERVATIONS

The three classes for observations were based on homogeneity because they included the same level of English, upper-intermediate. These classes were selected because they were willing to be observed. Observations were held within the ESL classrooms at the SL. Two regular adult ESL classrooms were visited, and a third class was observed during two sessions that included a morning classroom and an afternoon multimedia lab.

ONLINE SURVEY

This study included an online survey. The survey respondents were chosen as both current SL students and the former students of FDY in Sabanci University. This group was also homogeneous because they had the same experiences with the same courseware and instructional methods in the SL. I sent these respondents the online survey's URL. Online responses were obtained from fifty-one students and then analyzed. The tool I used was *surveymonkey*.The survey allowed me to see the paradoxical data that I might have overlooked, "aiding with conceptual development and instrumentation" (Miles & Huberman, 1994, p. 41). It simply made the data analysis much easier. Since Glaser and Strauss (1967) propose a *grounded theory* in order to weave a pattern through a comparative analysis, I concluded that the use of the survey would enrich the study by providing more evidence. Some of the questions asked in the survey were as follows:

• What types of technology do you use outside the school?
• How often do you use computer(s)/laptop a week?
• There was meaningful learning created during ESL sessions because teachers encouraged us to ….
• Please tell which one of the technological tools below you heard and/or used as part of your ESL courseware.
• As a courseware management system (CMS) on which SUCourse is based, I use(d) the … open-source portal to collaborate and learn online in my ESL classes.

The survey was designed in a *multiple-choice* (only one answer) format in order to elicit the topics in-depth. Fifteen questions were asked to FDY students. The results drawn from the online survey indicated that the

questions were responded by eighty-one students, fifty-one of whom completed all of the questions. The cross-sectional type of survey that included both qualitative and quantitative methods explored answers to both the first research question about ESL students' perceptions about ICT implementation in class, and the third research question in order to find a salient pattern in this study. It is used to gather information on a population at a single point in time. It also tries to determine the relationship between two variables such as—as this study offers—the SL students' perceptions of ICT and its implementation in adult ESL classes, or school (institutional) support at SU/FDY and implementation of ICT, which would answer my first and third research questions. Note that the relationships between these two different factors could merely be provided by the use of a cross-sectional type of survey. The relationships among all qualitative (descriptive) responses such as "There was meaningful learning created during ESL sessions because teachers encouraged us to think and do analytically and creatively with technology (53.3%)" and quantitative responses such as "I use computer(s)/laptop once, twice, three times, everyday (97.4%), never, etc. a week" allowed for the construct of this study's *blended unified design* (BUD). The results and analysis then allowed for the construct of the *blended unified design* (BUD). Students were asked questions related to fifteen topics. These topics that included one question were:

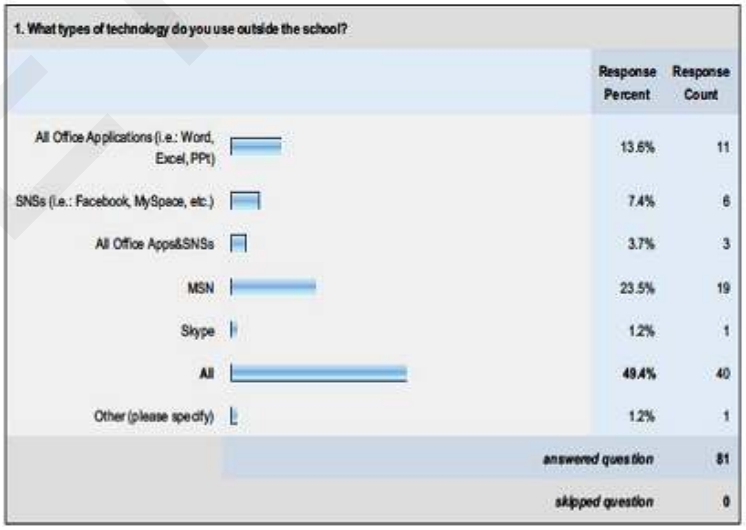
• *Student reflection on technology use*	• *Cognitive learning in ESL*
• *Frequency of technology use*	• *Collaborative learning*
• *Drawback of technology*	• *E-learning environment*;
• *ESL teachers' ICT performance*	• *Research database software*
• *Creating meaningful learning*	• *Software for academic honesty*
• *Learning as an adult*	• *Feedback*
• *ICT implementation in teaching*	• *Comments* (See "Comments from Online Survey")
• *ICT practices in ESL classroom*	

Question #1 is presented below as an example to student response ratings:

Student Reflection on Technology Use

All of the eighty-one students responded to question one. This question indicated a 49.4% response that came from forty students who stated that they use all types of technology (i.e., all *Office* applications, *SNSs*, *MSN* and *Skype*). The second highest response percent was 23.5% responded by nineteen students—about half of the first response. The lowest response percent was 1.2% with *Skype*. One respondent (1.2%) specified in the "Other" section that she/he used all *Office* applications along with *Dreamweaver Photoshop C++*, and more. Their responses are indicated in the following chart:

ICT IMPLEMENTATION IN ADULT ESL CLASSES



Comments

Question fifteen was aimed to assess ESL students' comments on the strengths and/or weaknesses of FDY, and what they thought could be retained or changed to enhance their academic performance in ESL. *Quia*, *Lextutor,* and *Nicenet ICA* were the three courseware to which they most often referred when responding to this question. Thirteen out of sixty-eight ESL students commented on this question. The results are presented in the following table:

Please comment on the strengths and/or weaknesses of FDY you think could be retained or changed to enhance your academic performance in ESL. You may answer this question according to software programs such as *Quia, Lextutor, Nicenet ICA*, etc. that might be used in you classroom. Thanks!
1. Nicenet is a very useful site to see your teachers' feedback on your works and also we can see other people's works as well.
2. Sometimes we spent too much time to learn new computer programs than instead of learning English. Except for these problems, every technological use was very effective.
3. It goes without saying that FDY is essential for every single student who wants to learn and use English perfectly.
4. When I compare the education in FDY with other schools, I can see that FDY gives more speaking, understanding and writing based education. At other schools, they are trying to learn every unnecessary details of grammar which does not make any sense. As a result of this, FDY gives more useful English education than others.
5. There is nothing I earned at FDY. Just a waste of time…. There are teachers who do not deserve the money they earn….
6. In the past, students were not allowed to use Turnitin program. It made hard to make sure about the sentences that you interprete correctly.
7. Technology use in the classes of FDY is not so bad. However, it is sometimes useless. As I denoted on one of the previous questions, it makes students kinda lazy.
8. It is different from high school and use of technology and attention of teacher are very effective for the students who try to learn English in the School of Languages.
9. It really helped me to attain greater success in faculty lessons. Surely, academic style based writing exercises will help us in continuous business life.
10. Weakness: Note-taking, speaking; strength: Reading.
11. In FDY, we use different kinds of programs which I didn't know before and they were beneficial for my improvement.
12. Developing is up to my own struggles.
13. We have used Nicenet to share our papers. We have used Nicenet sometimes, to get more papers to read and to criticize other papers. Nicenet should be used every time in the class; that is, in every topic and activity.

Table 1. Comments from Online Survey (Q15). The table above presents FDY students' comments on the strengths and/or weaknesses of the program in terms of the effective and efficient implementation of ESL technologies that are used in their classrooms, such as *Quia, Lextutor, Nicenet ICA*, etc.

RESULTS

Findings from the interviews and observations additionally imply that there is a symbiotic relationship between the utility of technology in adult ESL classrooms. In this study, it is my finding that ESL teachers also attest to the benefits of ICT as a positive instructional approach to their discipline. Hence, the assertion is that a successful integration of ICT and andragogy, as a complement to constructivism, can engage ESL students and teachers in thinking positively about their own learning/teaching. Another assertion is that administrative support is an important catalyst in and interactive process that leads to pedagogical change in bilingual classes: a transformative process that leads to young adults' meaningful, self-directed learning. The results demonstrate the need to enhance not only *teacher-led,* but a *student-centered* learning/teaching in bilingual classes in Turkey via emerging technologies. This study describes a "best practice" program that prepares students to acquire full mastery in ESL with the successful implementation of ICT unified with constructivist pedagogy and andragogy. The findings and proposed model contribute to a needed expansion of current research in bilingual education, expand the available literature on the topic, and provide new insights to inform possible—and considerable—paradigmatic shifts in the Turkish bilingual education system.

DISCUSSION

The results derived from in-depth interviews, in-class observations, and the online survey indicated that the research questions chosen, methodology used and the hypothesized *blended unified design* (BUD) demonstrated participants' positive perceptions about the implementation of ICT in the adult ESL classes in Turkey. Students' and teachers' positive outlook toward the use of emerging technologies in their learning and teaching, and the amount of school support both university wide and at the SL allowed me to understand the best practices at Sabanci University, a private higher educational institution. These perceptions and administrative support additionally helped me to develop the *blended unified model*, (BUD), where andragogical teaching methods converge with pedagogical principles that are constructivist in nature, supported and enhanced by ICT.

Correct implementation of ICT in ESL classes gives me hope that the Turkish educational system is ready to transcend itself through modern technologies that can be thoroughly applied in bilingual education. Despite the common opinion, learning and teaching ESL/EFL is not an easy task. When technology is dominant, gaining full

mastery in a non-native language becomes more challenging. However, this study asserts that technology can leverage understanding, and that ESL can be better learned and taught with ICT that includes educational technologies such as *Quia*, *Lextutor*, *Nicenet ICA*, and more. Thus, ICT is able to engage students in gaining diverse skills in English. Adult ESL students, ESL teachers, and the administrators at Sabanci University School of Languages prepare their students to acquire 21st century digital literacies via these new technologies. If gaining digital literacies is essential in bilingual education, then the combined approach I offer in this study cannot only cause a developmental change in bilingual learners, but generate higher performance for adult ESL students' learning. These changes owe a great deal to ESL teachers who use their best judgments for change, and utilize the best practices with technology to generate higher academic achievements in their classrooms. They are highly conscious of both the value of adult approaches and ICT implementation in class. Knowles asserts that rather than incorporating traditional methods into their teaching, educators need to integrate innovative instructional methods for adult learners who might have a tendency to resist learning new subjects and under unfamiliar conditions that might not fit their self-concept (Knowles, 1970). With regard to all of these observations, therefore, BUD gives me more motivation to work on educational technologies that will support best learning/teaching practices in bilingual classrooms. Despite the budgetary restrictions, it is undoubtedly that Turkey is a rapidly developing country in several aspects, and thus students can become self-directed learners as much as teachers can apply cutting-edge technologies to create meaningful and self-directed learning in their classrooms. Sabanci was an exceptional model that promoted combined pedagogies, constructivism and andragogy, supported by in-class technology that spurred a considerable change in students' development and learning a second language. It is very likely that this model can also be utilized with support of ICT in other Turkish schools that teach ESL.

CONCLUSION

This study was conducted in one Turkish private university's preparatory school (FDY at the School of Languages) where implementation of ICT (i.e., *Quia*, *Lextutor*, *Nicenet ICA*) in adult ESL classrooms was highly effective and efficient. The findings in this locale demonstrated a best practice program that blended theory and practice with a combined approach of constructivist pedagogy and andragogy supported by ICT. This unified approach to bilingual learning/teaching is essential in terms of a broad understanding of ESL students' learning and teachers' instructional methods along with the school's support. Examining the results through a triangular method led to the construct of a new hypothesis in this literature, the *blended unified design* (BUD) of learning and teaching ESL with ICT. The BUD also showed a way that the divide between ESL learning/teaching with and without cutting-edge technologies can be closed in other private universities' preparatory schools although no generalizations should be made from one small study, no matter how promising. Developing a new hypothesis, BUD, was crucial in this study since this resulting model designed for both ESL learners and teachers addresses a two-dimensional change: 1) developmental at the micro level; 2) educational at the macro level. The fact that technology contributes a great deal to both students' enhanced academic success in English and teachers' better instructional practices makes it an essential component to stimulate this change.

Drawing upon results from the three research methods (interviews, observations and survey) that provided both qualitative and quantitative data confirmed and concluded that a convergence of art (ESL learning/teaching) and science (use of particular appropriate ICT tools) can enhance ESL teachers' instructional quality, and thus provide young adults at English preparatory schools a broader perspective to fully acquire a new language. In-depth interviews with students, teachers and school administrators, in-class observations, and the online survey responses enabled me to see that learning and teaching ESL by support of emerging educational technologies in Turkish higher education exists, can be highly effective and efficient.

My research findings, combined with the theory-in-use allowed me to build a new hypothesis, BUD. It is a model that arose from my concern to address a current educational issue within the bilingual learning and teaching environments in Turkey, particularly when utilizing technologies in adult ESL classes is under close lens. The model was further developed to offer a solution through a unified approach of learning and teaching ESL through ICT. I assert that the BUD hypothesis could be a recipe for enhanced academic success in bilingual education in Turkey. In spite of budgetary restrictions and/or underestimation of this field, initiatives can be taken by MoNE and other private universities. FDY at the School of Languages at Sabanci University has taken this initiative, and has been an exceptional model with best ICT practices in bilingual education. These practices not only helped the ESL students to acquire full mastery in English via technologies, but also encouraged them to become confident adult learners and ideal citizens mindful of 21st century literacies. The expectation from this study is that current best practices with ICT in bilingual education can lead to new perspectives for further research in this literature, spur a remarkable change in the educational system in Turkey, and thus allow for better practices in other private higher educational institutions.

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INTERACTIONAL FREQUENCIES AND PATTERNS OF INTRACULTURAL CONTACT AMONG ETHNICALLY DIFFERENT FACULTY MEMBERS AND STUDENTS IN A SYNCHRONOUS DISTANCE INTERACTIVE CLASSROOM CONFERENCING

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ABSTRACT

The southeastern region of Turkey is home to significant populations of Turkish nationals of Kurdish and Arabic heritage. Objective of the study is to analyze the interactional frequencies and patterns of intercultural contact among ethnically different faculty members and students of Istanbul University (IU), Istanbul, and Harran University (HU), Urfa, involved in a project of Synchronous Distance Interactive Classroom Conferencing between the two universities. A total of 260 students at IU, 150 students at HU and 16 faculty members were involved. Method of direct observation instrument was used to analyze the contact patterns that occured among various Turkish students from IU and Turkish students of Kurdish ethnic backround at HU. Faculty members and students from IU for the most part, were urban-educated in Istanbul and found themselves having to interact with the faculty members and students of HU located in Urfa, Southeastern Anatolia. Results: This model permitted interaction between the students at IU and HU and instructor in real-time during and off the class time and problems did occur as a result of intracultural differences. Both sides lacked sensitivity and knowledge about issues related to cross-cultural communication and interaction. In conclusion,The findings revealed that the groups engaged in narrow interaction patterns and there was a virtual wall between the students of IU and HU which was difficult to overcome.

Keywords: cross-cultural contact; intercultural contact; intercultural relations undergraduate education, synchronous distance learning, distance education, classroom conferencing, intercultural communication, virtual walls

INTRODUCTION

Many people have preconceived ideas and stereotypes about cultures and co-cultures. Most of these stereotypes are probably erroneous, and built walls between cultures. “Intracultural communication” is often a trigger for stereotypes. First a definition of “Intracultural communication” is “the type of communication that takes place between members of the same dominant culture, but with slightly different values, as opposed to “intercultural communication” which is the communication between two distinct cultures. An example of intercultural communication triggering a stereotype would be if a person in the dominant culture, let’s say of Turkey, spoke Turkish with easterner, in other words Kurdish, accent. If a non-Kurdish speaking person hears Turkish spoken with Kurdish accent, they may assume the person is of low intelligence and rough in nature. These initial thoughts are unfounded and more than likely incorrect.

Cultural diversity is not a new phenomenon inside the walls of the school, but it has undergone changes in the way it is viewed. It has gone from models that postulated that integration into a society should be through assimilation into the dominant group of the culturally different, to more modern discourses about recognition and valuing, to a greater or lesser extent, of the “other cultures” by society and in schools.

The evolution observed in other societies does not differ greatly from the Turkish case, although the rhythm and the timing do not coincide. Although it is true that there is still a long way to go before Turkey, and, specifically in Southeastern Anatolian region, one of its underserved areas.

The Southeastern region of Turkey has been undergoing development efforts since the 1970s through the Southeastern Anatolia Regional Development Project, known worldwide by its Turkish acronym—GAP (Guneydogu Anadolu Projesi). Turkey is a culturally diverse society. The Southeastern Anatolia region, where the GAP project is located, is heavily populated by Kurdish and Arabic communities. There has been limited intercultural interaction among these people from the west and southeast in terms of cross-cultural marriages or shared cultural celebrations. And, until recently, the region experienced quite tense and complex difficulties as a result of PKK (Kurdistan Worker's Party) terrorist activities causing the loss of 30,000 innocent human lifes. Added to this, the relative limited interaction between this area and the rest of Turkey has contributed to a lack of understanding between these regions and other parts of the country. PKK terrorist activities ended in 1999 when their head was captured and put into jail. Terror was over and it was time to reconnect the southeast to the west and contribute to the human development of the region. I first talked to the president of IU to start Synchronous Distance Interactive Classroom Conferencing between IU and HU. He accepted the idea and asked me to go and talk to the president of HU. I went to Urfa to talk to the president of HU about the project. I said to him that as a faculty memeber from the western part of the country wanted to do something to improve the quality of higher education in the Southeastern region as part of GAP human development project. The presidents of both IU and HU approved and welcomed the project and gave their full support. IU Ziya Gun Foundation provided the financial support for the full cost of the project, 150,000 USD.

Students are admitted to the universities through centrally administered university entrance examination in Turkey. The students with higher scores are usually admitted to the ivory league universities in the big cities located mainly in the west and those students with relatively low scores are admitted to the other universities located especially in the southeastern part of the country. Because of the terrorism threats for many years Turkish students from the western part of the country did not go to these universities located in the southeastern part of the country. Only those Turkish students of Kurdish backround could attend these universities because they are the ones who knew the region and could make it there because of their ethnic backround. Before I started the project I made several trips to HU on my own and talked to the students about what they wanted. They first asked for the faculty members from IU to come and lecture at HU. This was impossible because faculty members from IU still considered the southeastern region not a safe place to travel. The students said if this was not possible then they wanted to take the courses from the same instructors simultaneously with the IU students through synchronous distance interactive classroom conferencing. They did not want to take a seperate course which was designed for them and could also be considered as second quality.

Objective of this study was to observe and examine the type and amount of contact and intercultural interactions as well as the nature of such contact (e.g., topic of discussion, duration, relationship context) took place among the students of IU and HU who were involved in a distance synhronous classferencing project. It was designed to teach basic science courses simultaneously to both IU and HU students using two specifically designed general purpose technology enhanced classrooms in two different universities, Istanbul University (IU) in Istanbul and Harran University (HU) in Urfa, located 1500 miles apart in Turkey. Direct observation instrument was used to analyze the contact patterns and specific intercultural interaction frequencies and dynamics as found among ethnically different students, Turkish students from IU and Turkish students of Kurdish ethnic backround from HU.

Understanding the complex nature of intercultural contact will help us understand the particular dynamics of contact that exist among ethnically different groups (in general and in relation to specific ethnic group relations—for e.g., Turks/Turks of non-Kurdish ethnic backround–Kurds/Turkish citizens of Kurdish backround). Because communication problems among ethnically different groups in general is our biggest problem whether it occurs in the universities, workplaces or in our daily lives.

METHODS

A technologically enhanced classroom of Istanbul University, Istanbul, was connected to another technologically enhanced classroom of Harran University in Urfa which is located in the southeastern region of the country, 1500 km apart from Istanbul. The purpose of the project was to enable the faculty members from the Science Faculty, mainly mathematics, Physics and from Bussiness School of IU to lecture simultaneously also to the students at HU because there was a lack of faculty members who could teach those courses at HU. The students at both universities were listening to and watching the same instructor at the same time and they (HU students) could see IU students and IU students could see HU students all the time through videoconference. HU students could ask question any time they wanted because the lines were always open and they had microphone in their class swicthed on all the time. So it would not make any difference where they are, Istanbul or Urfa, since they were watching, asking questions and listening to the same instructor. I sit in the IU classroom for the first six months of the project to observe and examine the amount of contact and type of intercultural interactions took place among the students. I also went to HU several times and brought in HU students to Istanbul during semester breaks to help resolve the intercultural communication problems. "Intercultural interaction" was defined as a "conversational exchange between at least two racially/ethnically different persons", (Halualani et al., 2004). With this definition in mind, "interactional nature" was conceptualized as those elements that actually constitute the interactional process of contact such as the following: duration (the length of time in which contact occurs), setting (in what environments contact takes place), relationship type (the kind of relationship between interactants—as strangers, acquaintances, friends), and interactional topic (the specific conversational topics are discussed during contact, including at what point is race/ethnicity discussed and what are the difficult points of conversation) (Halualani et al., 2004).

RESULTS

The HU students first asked me to find one student in the IU class who was from Urfa at the begining of the semester. They gave me the name of the student they wanted to get in touch. By chance there was one student who was from Urfa and at the same time IU student and attending one of the physics classes. They first got in touch with him and asked him to provide them lecture notes and previous exam questions etc. They also sent him some money to buy books and lecture notes of the previous classes of the same instructor and sent to them. They also sent him money to buy videocassettes and give them to the technicians in the IU class to record the lectures and put them into the server so that they could view the lectures later if needed or when there was a communication line problem during the videoconference. That student immediately found me and appreciated what I was trying to do for his friends back in Urfa. He and students at IU asked me whether I was a Kurd or Turkish citizen of Kurdish backround. They were shocked to learn that I was neither of them and only a Turk with no Kurdish or any other ethnic backround. They told me that unless someone was either a Kurd or Turkish citizen of Kurdish backround, no one would spent so much time and effort to initate this project. They also learned that the entire project was financed by IU.

The videoconference lines were open from 7 a.m till 11 p.m. everyday between the two universities. I used every opportunity to introduce the students to each other so that they would communicate with each other. They were third and fourth year university students with different ethnic backrounds. At the begining there was some hesitation on both sites and had difficulties saying hello to each other. Especially the female students from HU could only say hello to other female students at IU and could never talk to male students at IU. The same thing was also true for the female students of IU. They could not say hello to another male student from HU. During lunch breaks and other breaks I encouraged the instructors at IU to talk to the students at HU and asked them to chat with them using their first names. That appeared to be very difficult. I even encouraged the male students at both sides to say hello to each other and asked them to give each other their email addresses with little success. Students at both universities were experiencing the existence of some sort of virtual wall between them and it was very difficult to cross or jump over. They just could not get that conversation started. This went on for almost three months. I tried to make fun some times in the class during the breaks that unless they make friends they would not pass the exams. I was the only one who was acting like a facilitator to introduce them to each other. Both sides were appreciating what I was trying to do but they themselves did not try hard to reach out and touch some one from the other site.

One of the faculty members in the Physics Department at IU was Turkish who was born in the southeastern part of the country and she felt empathy to those students of HU. She came and thanked me for what I was trying to do. She was the only one who could dare to go to Urfa and lectured from HU classroom back to IU classroom and then the IU students were listening to her from HU classroom for three days during her stay in Urfa.

From time to time I repeated my statement that unless students at both sides make friends with the other site they could not pass the exam! I said it was the requirement of the course to reach out the other site and say hello to each other. Unfortunately, they just could not do it.

During the first semester break we decided to bring the HU students to Istanbul and introduce them to the IU students and arranged a sightseeing tour in Istanbul. HU provided the financial support for the trip and about eighty students from HU came to IU and met IU students in person. I asked them to shake each others' hands and learn each others' first names. I asked the IU students to join them during their sightseeing tour of Istanbul. It melted the ice a little bit but could not break the virtual wall existed among them. Even though they were next to each other the virtual wall was always there seperating them from each other.

The students took the midterm and final exams at the same time and HU students performed equally well on the exams. But the IU students complained that the exams were not as tough as it used to be in order to make a favor for the HU students. They said the questions were not as difficult as it used to be because of the HU students taking the same exam.

The HU students told me that there was a transfer student from HU to IU in the Physics Department. They kept asking me to find him and ask him to come to the class and talk to them using the videoconference system. Finally I found him and asked him why he had not been attending the classes. He said he had transfered to IU Physics Department because he was the top student at HU. His grades were high enough to be accepted as transfer student to IU. Practically speaking he was supposed to be doing well at IU. However it did not happen that way. He said when he came to Istanbul he had culture shock and felt isolated at IU. He said he could not make friends with the IU students and the atmosphere of IU was very different. He could not feel good enough to attend the classes, sit with other IU students. Therefore, he was doing poorly in the exams and was about the drop out of the university. He simply said he felt he was not welcomed to IU by the IU students.

The IU faculty also gave their email addresses to the HU students so that they could ask questions any time they want. IU faculty was also available during lunch breaks and evenings for any question HU students might ask and could use the videoconference system to discuss any problem.

We had one particular problem with the economics class given by IU Economics Faculty member. This is one good example of what kind of intercultural interaction and communication problem we had in the project. She was a professor and giving her lectures only to HU students between 4-6 p.m. during the Fall semester. That was the only time slot available to deliver that class. However in November our holy month Ramadan started and almost all of the HU students started to fast. The students asked me to talk to the professor to make some changes of the class schedule because breaking fast time was around 5.15-5.30 p.m. So they wanted one hour break between 5-6 p.m. to break their fast and continue the class from 6-7 p.m. IU was known as the most secular university and the rector of IU was famous with his secular views in the country so the economics professor was too. When I talked to the professor about making some changes in the class schedule according to the students' wishes she refused to make any change in the class schedule. She said she was a secular faculty member and she would not give in to the demands of religous students. She accepted fasting was a religous act and those students who were fasting were considered to be religous students. Then the students warned me few more times and they said if their demands were not met everybody should face the consequences. I went back to her again and talked about what the students had said for the last time. She once again refused to make any change in the class schedule. I talked to the students and told them that she had refused to make any change. Then the students told me they knew what they were going to do next and when I asked them what they would do they told me to wait and see. The next day she gave her first hour lecture from 4-4.50 p.m. and we had 10 minutes break. She went to the room which faculty members used it for drinking tea or coffee and to get

some rest. When she and I got back to the classroom we saw all the students had gone to the cafeteria to break their fast and there was no student left at the HU classroom. She and I learned the reality of the southeast a hard way and at the end she had to accept their demands and made the necessary changes. After that walkout she started to deliver her lectures between 4-5 and 6-7 p.m. The following years they paid attention to what had happened in the past and made the class schedules accordingly so that a similar unpleasent event would happen again.

The students were given the exam simultaneously at the same time and we could observe them what they were doing at the HU calssroom while taking the exam. We would send the questions by email and could see the teaching assistant at HU print the questions and distribute them to the students in the class. We could remote control the cameras so we could watch all the students in the class. We were shocked during the economics class final exam. We used to have the classess with around 20 to 25 students and suddenly we saw around 130 students taking the exam at HU and all trying to see each others' paper during the exam, some kind of cheating. This was unacceptable to us and I immediately called the dean of Economics School of HU and told him what was going on in the exam. He said the other students were from the previous years who could not sign up for the course since there was no faculty to teach that course. Now they are sophomore and have to take the exam and pass since it was a required course. We had not been told about it before. As a result of this exam we could learn one more truth about how students at HU pass the exams and quality of teaching in a university located in the southeast of Turkey.

DISCUSSION

The students of IU knew that the other students were from HU which is located in a region where we lost 30,000 inocent peoples' lives due to PKK (Kurdish Workers Party) terrorist and seperatist movements in the region. They (students both at IU and HU) all were raised by their families that the others are the others and they are different and could not be trusted and/or to be friend. The virtual walls for them were already erected by their parents while they were growing up. Virtual lines had already been drawn between these two groups of students long before they got into the universities. Even if they sit next to each other there are virtual lines between them and very difficult to cross over.

In an academic meeting I met the Dean of Science Faculty of Istanbul Culture University (ICU), a private (foundation) university and talked about my project and the problems I had with the HU students and intercultural communication problems between the IU and HU students. Since he was working in a private university and they also had to admit students from the eastern and southeastern part of the country as long as they score high enough to be admitted to ICU and pay the tuition and fees. He said during the first days of each academic year they observe the students in the class and identify those students who come from these regions and show signs of adaptation problems to ICU and Istanbul, a city of 15 million people. He said they opened a special course for them under different names and ask these students to sign up for this course (Figures 1 and 2; Life Culture or Art of Living elective course)). The course was designed to make their adaptation to ICU and Istanbul easy and as fast as possible. For example, they identify the students who do not wear blue jeans because of the cultural problems especially those who are from the southeastern part of the country. So they take them to a big store and do some shoping for them and ask them to try some blue jeans on and wear them. They are mainly male students but very few female ones also come to ICU from this region. After they get used to wearing blue jeans pans and shirts etc they make reservations and take them to the cinemas, teathers, concerts, very good restaurants etc. He said all the expenses are paid by the university. He said they also teach them, for example, how to order and eat fish in an expensive fish restaurant along Bosphorous and also how to order a meal. They also take them to big hotels for dinners or just to drink coffee. He said they want them to be able to enter a very expensive and luxurious hotel and restaurant and not get scared. They later take them to the discent night clups which students usually go and to special dance courses. They teach them how to dance western dances especially valse, polka, cha cha etc. He said they also teach them how to introduce themselves to others or how to start a conversation. He said they call the course "Survivor Course". He said this course was very popular and helps them adapt to Istanbul life and also develop communication skills to interact with other students at ICU. They also offer special course to them to teach how to speak Turkish without southeasterner accent etc. Otherwise they would not be able to make it or survive in Istanbul and ICU. And he said the most important thing is that they will represent ICU when they graduate. The administrators of ICU know that if they cannot communicate well and represent

ICU well it will tarnish the image of ICU in the future. He said it usually takes them one semester to get these students into shape but sometimes two semesters to get these students to feel confident and comfartable and join the student life at ICU. He said they found asking these students to wear blue jeans which is a symbol of being a university student in Istanbul at the begining of the course was the the most important part of the course. The students later were interviewed about the course for their feedback. He said the feedback they got from these students were very positive and they all appreciated what they went through and really liked it very much. He said this is how they solve their intercultural communication problems which exist among the students from different ethnic backrounds studying in the same university. A similar course, under the name of 'Istanbul' elective course, is also open for students in Bahcesehir University, Istanbul, Turkey (Figure 3)

There is no need to pretend that there is no problem among the different people with different ethnic backrounds in the country. Students are raised in the families which are prejudice against the others. People with different ethnic backrounds in the central, western, southern and northern part of the country have some kind of prejudice against the people with Kurdish ethnic backrounds who usually live in the southeastern part of the country. Because we have lost almost 30,000 inocent people lives in fifteen years (1984-1999) due to the terrorist activities carried out by the terrorist organization of PKK. This caused a decline in quality of education in the souteastern part of the country since no faculty member wanted to go and work there. As a result of this there was a severe shortage of qualified faculty members in the universities located in this underserved area of the country. When I first went and talked to the students about my project they welcomed it first. After one year they started to complain about the project because they said they had to study harder more than ever. They used to study less and pass the exams easily. They also complained that they could not make good friends with the IU students because of the prejudice they have against them. They said they could feel the sensetivities of the IU students when they were talking to them. Students at HU spoke Turkish with Kurdish accent very distinctive to that region. Most of the students belong to big tribes in that region. So the degree of influence one student at HU has over the other classmates depends on which tribe he/she belongs to. If one student belonging to a big and powerful tribe decides to boycott the class no other student can resist his decision and no one can go to the class. We have experienced some kind of boycotting of the class initiated by one of these students due to unmet demands he had made to the rector of HU. Although it had nothing to do with the classes delivered by the IU faculty but he used his power to solve other problem they were having at HU through threatining to boycott the classes delivered by the IU faculty.

This was not like this twenty years ago and we all were very friendly to each other regardless of how we speak Turkish or where we were born. This kind of problem has started after PKK terrorist activities which created some kind of animosity among the peoples living in the country. Nowadays if you speak Turkish with southeasterner accent also called "Kurdish accent" in the big cities of the western part of the country you know and feel that you are not welcome into that society. It is even a problem for employment. For example, a teacher who is a Turkish citizen with Kurdish ethnic backround and speaks Turkish with Kurdish accent will have problem working in the west. The families immediately will show reaction to the school administrators and unfortunately ask them to change the teacher because they do not want their children to be taught by Turkish teachers of Kurdish origin. As a result, there is a virtual wall between the southeast and the west of the same country just like Berlin Wall used to divide East and West Germany twenty years ago. Those who are born and raised and educated in the southeastern part of the country are expected to live in that region, stay there, work there and not come to for example Istanbul, Antalya or Izmir to teach the children of the Turks of no Kurdish ethnic backrounds unfortunately. This is also true for faculty members. Those university professors who were born and educated in the southeastern part of the country and became professor in one of those universities located in that region know that they cannot get a teaching job easily in one of the universities located in the big cities in the western part of the country. It is not impossible but it is almost not possible for them to cross this virtual wall and come to the west and get a teaching job for example. We all know it very well and live with these virtual walls. Unfortunately, no Turkish university student with non Kurdish ethnic backround in the west would attend a class to listen to a lecture given by a professor who speaks Turkish with Kurdish accent.

When I talked to some female students at HU and asked them why they were studying at HU. They said their parents would not allow them to study in the West or in any other city. They must come home at

night and it was their only chance to have a university education in Urfa. So not only students but also their parents had their own virtual walls which their children also could not cross.

In another study carried out in the same city, Urfa, capital of GAP region, the factors perceived to impact cross-cultural communication, as well as what they thought were the causes of intercultural communication problems and difficulties, were also assessed. The participants who attended an intercultural communication workshop accepted education and language reportedly had the greatest influence on cross-cultural communication. The majority of the participants also identified prejudice and educational differences as the major causes of the difficulties and problems people have during cross-cultural communication (Cushner et al. (2003).

A columnist, Can Dundar of Milliyet daily newspaper, wrote about one of the most interesting exhibitions he has ever attended in his life in one of the European cities. He described the exhibition called "Virtual Walls". When he went to that exhibition he expected to see many art pieces hanging on the wall of the exhibition hall. Instead, to his suprise, when he got there he saw a big and completely empty exhibition hall and all the walls, ceiling and the floor of the exhibition hall were painted just white. That was the exhibition and he said at the begining he thought he had come to the wrong place. He asked the information desk to confirm whether it was the right place the answer was yes this was the exhibition. Then, he was given a headset and asked to walk through the exhibition hall with this headset. He was given information about how he should walk in the exhibition hall. He was instructed to stop when he hears a ring through the headset. Then he was expected to make a move to one direction or another. If he makes a wrong move he would hear the ring again. He should try making moves to different directions until the ringing stops. Then he should continue to walk. Again when he gets to a point where he is not expected to pass he will hear a ring again and is expected to stop. He should try to make a correct move till ringing in the headset stops again. Then he could continue to walk again. This is how the exhibition was about and it was to remind us that all of us have virtual walls in our lives which we cannot cross.

Halualani et al., (2004) set out to comprehensively investigate intercultural relations at a multicultural university located in the Western region of the USA. They studied what were the frequencies and patterns of intercultural interaction among the major racial/ethnic groups. How much intercultural contact were racially/ethnically different groups actually having with one another at the multicultural university? Which racial/ethnic groups were interacting with one another the most and the least? What was the nature of these interactions in terms of the type of relationship between the interactants, the location and duration of these interactions, and the interactional topics of discussions? They found that in some instances, racial/ethnic group members have isolated themselves away from such diversity, created tight-knit ethnic enclaves, and withdrawn from intercultural contact. Others had de-emphasized their racial/ethnic identities in response to the contradictory US societal messages that promote diversity while also pushing for the necessary assimilation of all cultural groups.

Bochaca (2006) studied the ethnic minorities and the Spanish and Catalan educational systems. Since the 1990s, cultural diversity in Spanish classrooms has increased notably with the arrival of immigrant origin students. This fact, together with the European Union discourses about consideration for cultural differences, have contributed to the appearance in Spain, and particularly in Catalonia, of an intercultural discourse.

Goto & Chan (2005) studied intergroup contact across two cultures This study examined the antecedents and consequences of intergroup contact between African Americans and White Americans. And they found perceived history of conflict influenced intergroup attitude directly.

CONCLUSION

Regardless of the sub-regional variations, the structural attributes of the southeastern Anatolia region are shaped by a variety of ethnic, religious, gender, and socio-economic dissimilarities. These variations not only shape people's thinking, behavior, and perception of others, but affect the communication between various institutions, social groups, and individuals as well (Cushner et al. (2003).

The findings in the studies carried out in the USA also illustrate a powerful contradiction: racially/ethnically different university students have limited interaction with each other in a context—the multicultural university—that hails and promotes "diversity". They have also confirmed this finding in the second research that students had limited contact (and in some instances, none at all) with those outside of their racial/ethnic group. This indicates that these individuals are not engaging in actual contact because of already entrenched racial/ethnic fragmentation and insular enclave formation throughout the US and even in culturally heterogeneous "Majority of None" areas such as in California (Halualani et al., 2004) .

Other authors also talked about the ongoing racial hostilities and divisions among students take shape on university campuses quoted in (Halualani et al., 2004), undergraduate campuses are "balkanized" with racially separated student organizations, intramural sports teams, and residence halls. They argue that although "surveys of undergraduate students indicate that a majority express a wish for more involvement with people of different backgrounds, the picture of campus life that emerges today is one of limited and often tense interaction between ethnically different students" . In conclusion, cultural diversity is not a new phenomenon inside the walls of the school and many people have preconceived ideas and stereotypes about cultures and co-cultures and the situation in our country is not different even from the most developed country and other European countries.

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Acknowledgement:
This study has been supported by Istanbul University Ziya Gun Foundation, Istanbul, Turkey.
The author wish to acknowledge Ms. Susan De La Cruz for copyediting the manuscript.

Figure 1: Elective Culture Courses at Istanbul Kultur University, Istanbul, Turkey

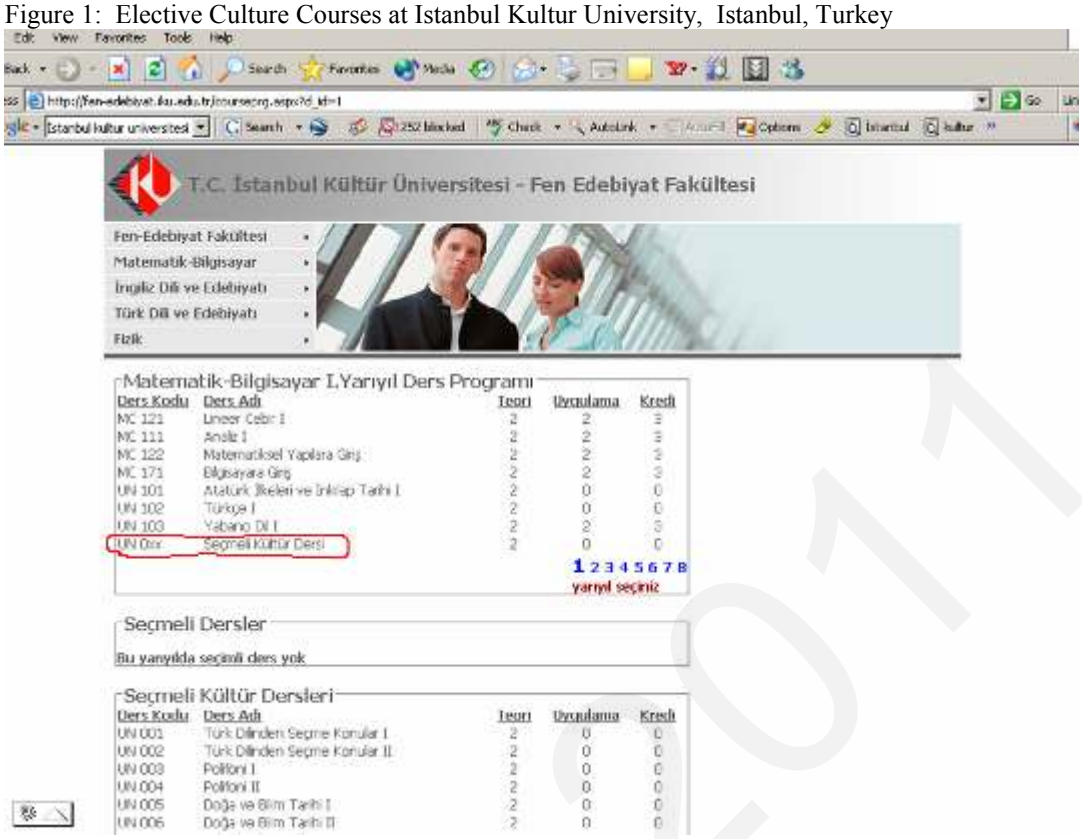


Figure 2: Elective Courses: Life Culture (or Art of Living 'Yasam Kulturu') at Istanbul Kultur University, Istanbul, Turkey

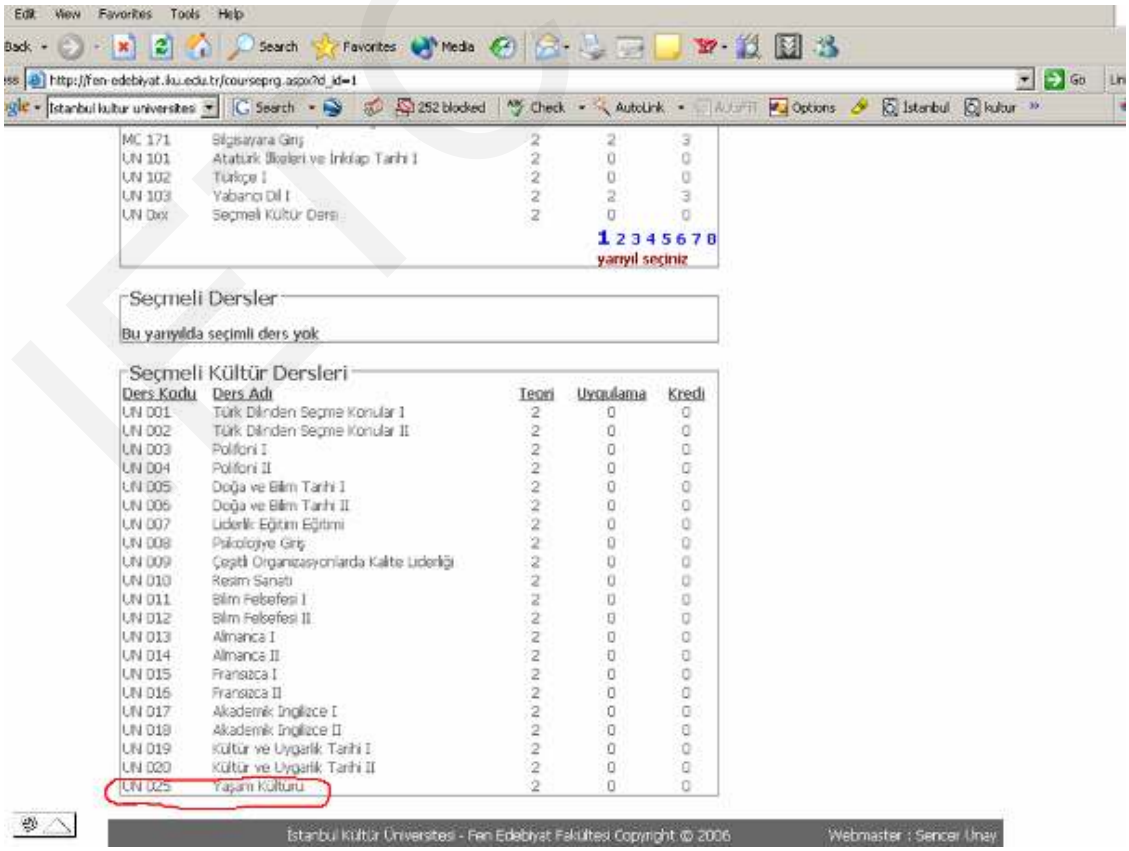
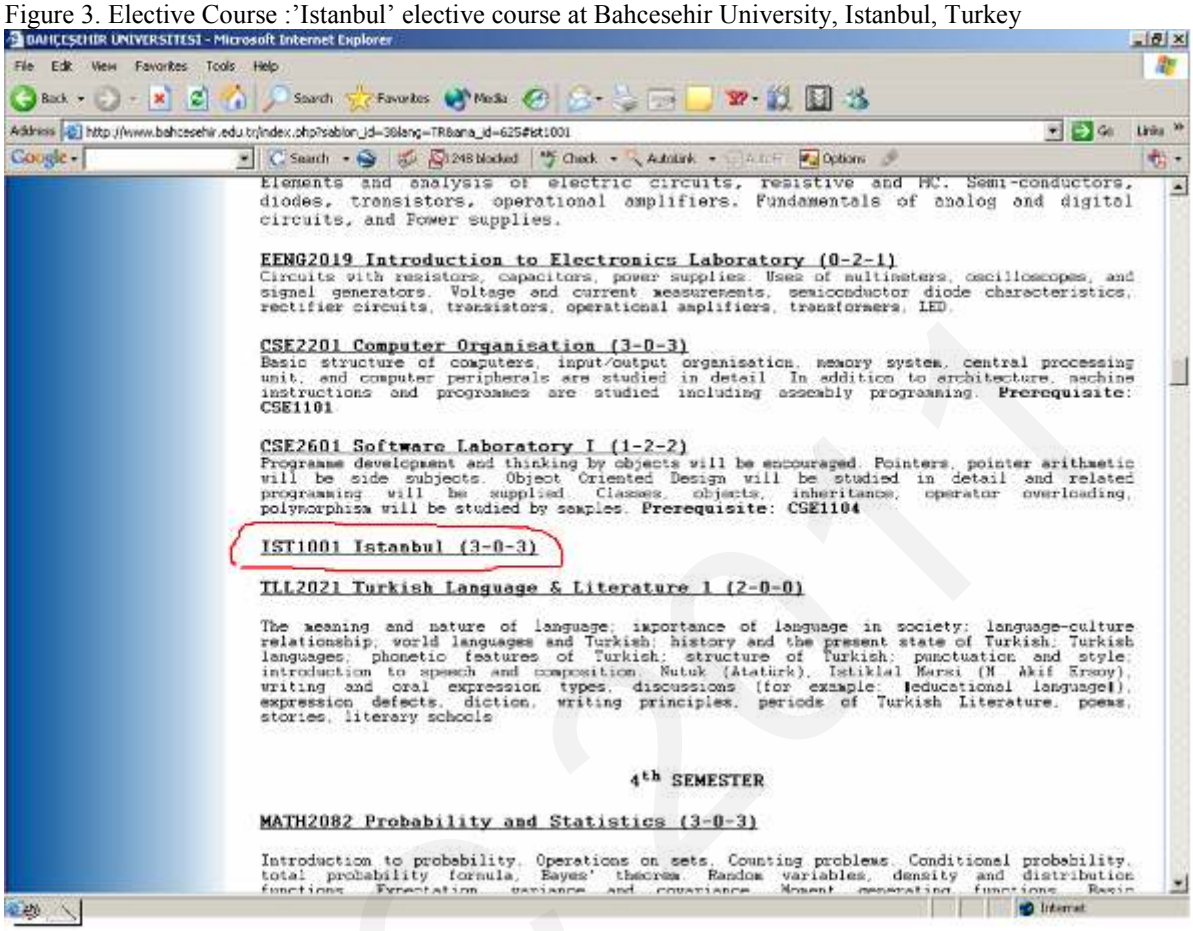


Figure 3. Elective Course :'Istanbul' elective course at Bahcesehir University, Istanbul, Turkey



INVESTIGATING PRE-SERVICE EARLY CHILDHOOD TEACHERS' ATTITUDES TOWARDS THE COMPUTER BASED EDUCATION IN SCIENCE ACTIVITIES

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ABSTRACT
The purpose of this study was to investigate pre-service early childhood teachers' attitudes towards using Computer Based Education (CBE) while implementing science activities. More specifically, the present study examined the effect of different variables such as gender, year in program, experience in preschool, owing a computer, and the frequency of computer usage on pre-service early childhood teachers' attitudes towards using CBE while implementing science activities. The study was conducted by survey method and the data were collected by using two instruments which were "Demographical Questionnaire" being developed by researchers and "The Scale of Attitude toward Computer Based Education" being developed by Arslan (2006) and adapted by the researchers for early childhood education domain specifically. The sample of this study was 215 freshmen and senior early childhood teacher candidates attending state universities in Ankara. The data were analyzed by conducting t-tests and ANOVA in order to determine the effect of independent variables on CBE attitudes.
Keywords: computer based education, early childhood education, pre-service teacher, science activities, and attitude.

INTRODUCTION

Nowadays, previous knowledge and skills are seen as obsolete and educational theories are required to be updated since teaching and learning perspective has changed (Molnar, 1997). In this change, technology has become a great power by providing rich environments for learning/teaching in education and it can be profited for instructional environment as much as other areas (Haugland, 2000; Marina, 2001). Although it was thought that computers were expensive and luxury machines in previous years, anymore computers have become part of daily life in recent times and as NAEYC indicated computers are integrated into early childhood practice physically, functionally, and philosophically" (1996, p.2). Additionally, research points to the significant contribution of computer use in the classroom as a learning tool in terms of enhancing cognitive, social, emotional, linguistic, and literacy skills in preschool children with considering their ages (Clements 1995; Haugland 1992; Shade 1994;Vernadakis, Avgerinos, Tsitskari, & Zachopoulou , 2005). Indeed, Kulik (1994) found that students from kindergarten to higher education and using computer based instruction got higher scores on achievement tests, learned in less time, and were more likely to develop positive attitudes in his meta-analysis study. When the effects of computers and computer applications are examined in science education, Gordin and Pea (1995) emphasize that it can be benefited from computer-based applications as powerful tools because they include visualization, modeling, and simulation for teaching scientific concepts and provide students opportunity to master concepts usually considered too complicated for their grade level. As technology becomes easy to use and

early childhood software grows rapidly, early childhood teachers have a responsibility to critically investigate the impact of new technologies on children and arrange to use technology to benefit children in learning environments (Haugland, 2000; Hartle, 2006; NAEYC, 1996, Yelland 2006). Even though teachers have some responsibilities, it is related with their attitudes in order to implement computers and computer based applications in educational system effectively (Yakin & Sumuer, 2007; Zhao, Tan & Mishra, 2001). Similarly, teacher candidates' attitudes play important role to achieve the integration of computers in educational environments (Yakin & Sumuer, 2007). Hence, it is essential to investigate pre-service teachers' attitudes towards using CBE for science activities in early childhood education.

Attitude towards Computer

According to Fishbein and Ajzen (1975, p. 6), attitude is ''a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object". In this theory, individuals' attitudes constitute their behavioral intensions. In addition, computer attitude has been described as a person's general evaluation or feeling of sympathy or antipathy toward computer technologies and specific computer linked activities (Smith, Caputi & Rawstorne, 2000). In the light of Fishbein and Ajzen's theory and computer attitude definition, it can be drawn conclusion that the profile of teacher's attitudes towards computer determines the degree of her/his intentions to use computer in teaching. This conclusion is supported with Levine and Donitsa-Schmidt's (1998) study emphasizing that an individual's behavioral intentions are determined by his/her attitudes towards computer.

The existing literature indicates that there are several factors influencing attitudes toward computer such as gender, age, computer experience, owing a computer and the frequency of computer usage. First, when the impacts of gender on attitudes are analyzed, it is seen that research present conflicting results. For example; some studies affirmed males had more positive attitudes than female (Bebetsos and Antoniou, 2009; Brosnan & Lee, 1998; Comber, Colley, Hargreaves, & Dorn, 1997; Torkzadeh & Van Dyke, 2002; Williams, Ogletree, Woodburn, & Raffeld, 1993). On the contrary, some other studies found that females had more positive attitudes than males (Ray, Sormunen & Haris, 1999; Rugayah, Hashim & Mustapha, 2004). It was stated in some studies that gender had no significant effect on attitudes (Kutluca & Ekici, 2010; Ropp, 1999; Roussos, 2007; Teo, 2008). Second, some studies investigated the effect of age on attitudes and found that younger people had more positive attitude than older people (Deniz, 2005; Erkan, 2004 Selwyn, 1999). The others confirmed that age didn't have a significant effect on attitudes (Gerçek, Köseoğlu, Yılmaz & Soran, 2006; Teo, 2008). Third, when the influence of computer experience on attitudes examined some studies demonstrated that computer experience had a significant effect on attitude (Asan, 2002; Kutluca, 2011). However, Yakin and Sumuer (2007) uttered that computer experience had no significant effect on attitudes. Forth, the studies analyzing the impact of owing computer on attitude were explored that this factor had a significant effect (Çelik & Bindak, 2005; Khine, 2001; Pamuk & Peker, 2009; Taghavi, 2006; Akbulut, 2008). On the other hand, in some studies there was no meaningful difference between computer ownership and attitudes toward computer (Aral, Ayhan, Ünlü, Erdogan & Ünal, 2007; Erkan, 2004). Lastly, the studies about the effect of the frequency of computer usage on attitudes showed that there was a statistically significant effect (Birgin, Kutluca, Çatlıoğlu, 2008; Mitra, 1998; Tsitouridou & Vryzas, 2003). On the other hand, Gercek et al. (2006) found no meaningful difference between frequency of computer usage and attitudes toward computer.

The Purpose of the Study

The purpose of this study is to determine pre-service early childhood (ECE) teachers' attitudes towards using Computer Based Education (CBE) while implementing science activities and to investigate effects of some independent variables such as gender, year in program, experience in preschool, owing a computer, and the frequency of computer usage on their attitudes.

Research Problem

In this research there are three questions as following:

1) What is the status of pre-service ECE teachers' attitudes towards using CBE while implementing science activities?
2) Is there a significant difference between attitudes towards the CBE while implementing science activities and gender, program in year, having practice, having a computer, frequency of computer usage of pre-service early childhood teachers?
3) Is there a significant difference between attitudes towards the CBE while implementing science activities and independent variables of pre-service ECE teachers in terms of university type?

METHOD

Research Design

This study was designed as a survey research. It was conducted to examine attitudes and demographic information of students in early childhood teacher education program attended freshmen and senior grade in spring of 2011 semester.

Context

The context of the study was set in two state universities in Ankara, Turkey. One of these universities' languages of education is English and in this university (University1), students take general computer course as "Introduction to Information Technologies and Applications" in their first year, "Computer Applications in Education" in second year, and "Instructional Technology and Material Development" in the third year. Moreover, students take "Basic Science" course and "Teaching Science in Early Childhood" in the second year. On the other hand, other university's language of education is Turkish and in this university (University2), students take general computer course as "Computer I" and "Computer II" in first year and "Instructional Technology and Material Design" in second year. Moreover, the students take "Science Education" course in third year.

Participants

Participants of this study were comprised of 58 pre-service ECE teachers from one university and 157 pre-service ECE teachers from other university, which were totally 215 with a mean age of 21 years (range 17-32). Most of the participants (40.5%) graduated from Anatolian Teacher Training High School, 22.3% graduated from Anatolian High School, 18.6% graduated from Vocational High School, 9.3% graduated from General High School, 4.2% graduated from Foreign Language Intensive High School, 0.9% graduated from Science High School and 3.7% graduated from other high schools. Moreover, according to results, 3.3% of participants indicated that they started to use computer in early childhood term, 63.8% of them started to use computer in elementary term, 26.5% of them started to use computer in high school, and 7.4% of them started to use computer in university term.

Data Instruments and Data Collection

In this study, data were collected by using two instruments namely "Demographical Questionnaire" and "The Scale of Attitude toward Computer Based Education". Demographical questionnaire was developed by researchers and reviewed by an expert. This questionnaire included thirteen items to obtain information about gender, age, grade, high school type, term of using computer, frequency of computer usage, purposes of computer usage, having computer, self evaluation about computer usage, having experience in an early childhood institutes, attending science course, and attending computer course. On the other hand, the scale of attitude toward CBE was developed by Arslan (2006) including 10 positive items and 10 negative items with 5-point likert scale. Kaiser-Meyer-Olkin (KMO) value of this scale was 0.88 and Barlett test significance value was 0.000. Cronbach- alpha value was 0.93 which means as good. It was adapted by the researchers for early childhood education domain specifically with keeping original form and checked by the experts. Therefore, the validity and reliability of this scale were satisfied.

Data Analysis

In order to determine the status of pre-service ECE teachers' attitudes toward the CBE while implementing science activities, the data were analyzed through frequency, mean, percentage, and standard deviation values as descriptive statistics. Moreover, independent sample t-tests were conducted to examine impacts of independent variables (gender, program in year, having practice, having a computer) on attitudes, and since there are more than two levels of frequency of computer usage, it was used one way ANOVA for group comparison, besides a Post-Hoc Tukey HSD test was employed to find which group causes the difference in the group comparison. Furthermore, in order to indicate whether university type makes a significant effect while explaining influences of independent variables on attitudes, independent sample t-tests were used.

RESULTS

Demographics of the Participants

Of the 58 participants, 53.4% were freshmen and 46.6% were senior, 94.8% were female and 5.2% were male, nearly all of them (98.3%) had their own computer, 60.3% had practice in an early childhood

institution while 39.7% have not, 46.6% attended science course while 53.4% did not, and 82.8% attended computer course whereas 17.2% did not attend in University1. On the other hand, of the 157 participants, 51.6% were freshmen and 48.4% were senior, 94.3% were female and 5.7% were male, most of them (76.4%) had their own computer, 54.8% had practice in an early childhood institution while 45.2% have not, 49.2% attended science course while 51.3% did not, and 97.5% attended computer course whereas 2.5% did not in University2.

Table 1. *Participants' Attitude Scores towards CBE in Science Activities*

	N	Minimum	Maximum	Mean	Std. Deviation
Total_attitude	215	37,00	87,00	69,9767	8.00668

According to Table 1, mean of pre-service ECE teachers' attitudes towards using CBE while implementing science activities is 69.97 (minimum 37, maximum 87).

Effects of Gender on Pre-service ECE Teachers' Attitude towards CBE in Science Activities

According to t-test results, it is found that there is no significant difference in attitude scores towards CBE in science activities between female pre-service ECE teachers (*M*=70.11, *SD*=8.04) and male pre-service ECE teachers (*M*=67.58, *SD*=7.24); *t* (213)= 1.06, *p*=.28 (two tailed).

Table 2. *T-test Result on Gender and Attitude towards CBE in Science Activities*

		F	Sig.	T	df	Sig. (2-tailed)
Total_attitude	Equal variances assumed	,153	,696	1,066	213	,288
	Equal variances not assumed			1,171	12,659	,263

Effects of Year in Program on Pre-service ECE Teachers' Attitude towards CBE in Science Activities

An independent sample t-test was conducted to compare the attitude scores towards CBE in science activities for freshmen and senior pre-service ECE teachers. Results shows that there is no significant difference between the scores for freshmen pre-service ECE teachers (*M*=69.56, *SD*=7.15) and senior pre-service ECE teachers (*M*=70.42, *SD*=8.85); *t* (213) = -0.79, *p*=.43 (two tailed). On the other hand, when it is examined in terms of university type, there is a significant difference between attitude scores towards CBE in science activities for freshmen pre-service ECE teachers (*M*=69.77, *SD*=6.79) and senior pre-service ECE teachers (*M*=74.33, *SD*=5.49); *t*(56)=-2.78, *p*=.007(two tailed), in University1. The magnitude of differences of in the means was approximately large effect (eta squared=.12). On the contrary, there is no significant difference between the scores for freshmen pre-service ECE teachers (*M*=69.48 *SD*=7.32) and senior pre-service ECE teachers (*M*=69.03, *SD*=9.42); *t* (155) = .32, *p*=.74 (two tailed) in University2. Specifically, senior pre-service ECE teachers have higher attitude scores towards CBE in science activities than freshmen pre-service ECE teachers in University1.

Table 3. *T-test Result on Year in Program and Attitude towards CBE in Science Activities*

		F	Sig.	t	df	Sig. (2-tailed)
Total_attitude	Equal variances assumed	,996	,319	-,790	213	,430
	Equal variances not assumed			-,783	196,213	,434

Table 4. *T-test Result on Year in Program and Attitude towards CBE in Science Activities in terms of University*

			F	Sig.	t	df	Sig. (2-tailed)
University1	Total_attitude	Equal variances assumed	124	,294	-2,784	56	,007*
		Equal variances not assumed			-2,825	55,718	,007
University2	Total_attitude	Equal variances assumed	1,476	,226	,329	155	,742
		Equal variances not assumed			,327	141,539	,744

*α=.05

Effects of Having Experience in Preschool on Pre-service ECE Teachers' Attitude towards CBE in Science Activities

According to t-test results, there is no significant difference in attitude scores towards CBE in science activities between pre-service ECE teachers who had practice in an early childhood institute (*M*=70.68, *SD*=8.56) and for those who did not (*M*=69.06, *SD*=7.17); *t* (213) = -1.47, *p*=.14 (two tailed). On the

other hand, when it is examined in terms of university type, there is a significant difference in attitude scores towards CBE in science activities for pre-service ECE teachers who had practice in an early childhood institute (*M*=70, *SD*=5.62) and for those who did not (*M*=68.69, *SD*=6.75); *t* (56) = -3.24, *p*=.002 (two tailed) in University1. The magnitude of differences of in the means was large effect (eta squared=.15). On the contrary, there is no significant difference in attitude scores towards CBE in science activities for pre-service ECE teachers who had practice in an early childhood institute (*M*=69.33, *SD*=9.19) and for those who did not (*M*=69.18, *SD*=7.34); *t* (155) = -.11, *p*=.90 (two tailed) in University2. Specifically, pre-service ECE teachers who had practice in an early childhood institute have higher attitude scores towards CBE in science activities than pre-service ECE teachers who did not have practice in an early childhood institute in University1.

Table 5. *T-test Result on Having Experience and Attitude towards CBE in Science Activities*

		F	Sig.	t	df	Sig. (2-tailed)
Total_attitude	Equal variances assumed	,703	,403	-1,478	213	,141
	Equal variances not assumed			-1,511	211,759	,132

Table 6. *T-test Result on Having Experience and Attitude towards CBE in Science Activities in terms of University*

			F	Sig.	t	df	Sig. (2-tailed)
University1	Total_attitude	Equal variances assumed	1,162	,286	-3,245	56	,002*
		Equal variances not assumed			-3,123	41,086	,003
University2	Total_attitude	Equal variances assumed	1,226	,270	-,114	155	,909
		Equal variances not assumed			-,117	154,85	,907

*α=.05

Effects of Owing computer on Pre-service ECE Teachers' Attitude towards CBE in Science Activities

According to t-test results, it is found that there is no significant difference in attitude scores towards CBE in science activities between pre-service ECE teachers who have computer (*M*=70.27, *SD*=7.84) and those who have not computer (*M*=68.58, *SD*=8.75); *t*(211)= -1.15, *p*=.24 (two tailed).

Table 7. *T-test Result on Having Computer and Attitude towards CBE in Science Activities*

		F	Sig.	t	df	Sig. (2-tailed)
Total_attitude	Equal variances assumed	1,112	,293	-1,157	211	,248
	Equal variances not assumed			-1,076	47,105	,288

Effects of Frequency of Computer Usage on Pre-service ECE Teachers' Attitude towards CBE in Science Activities

According to descriptive statistics, of the 215 participants, 35.8% spend less than 1 hour, 49.3% spend 1-4 hours, 12.1% spend 4-7 hours, 1.9% spend 7-10 hours, and .9% spend more than 10 hours for using computer in a day. Specifically, it can be concluded that pre-service ECE teachers mostly spend 1-4 hours in a day with using computer. Moreover, when it was examined the relationship between duration of computer use that pre-service ECE teachers spend in a day and their attitudes toward CBE in science activities, it was conducted one way ANOVA and results show that there is no significant difference between the computer usage time and attitude towards CBE in science activities, *F*(4,210)=1.5, *p*=.19.

DISCUSSION AND CONCLUSION

Overall the participants demonstrated positive attitudes towards computer based education while implementing science activities as shown by mean score 69.97 (minimum 37, maximum 87). This could be related with facilities and opportunities that are provided to the pre-service teachers at various stages of their education including before attending in teacher training program and experiences through university education. Additionally, it was resulted that gender, owing computer, frequency of computer usage did not have any effect on pre-service ECE teachers' attitudes towards using CBE while implementing science activities both in general and in terms of university type. This finding does not support to the past research that found meaningful difference between computer attitude and gender (Ray, Sormunen and Haris, 1999; Sadık, 2006; Yıldırım, 2000). However, some other studies stated that attitudes were not related with sexes (DeBlassioa & Bell, 1981; Deniz, 2007; Akbulut, 2008; Bebetsos &

Antoniou, 2008) which supports the outcomes of this study. A possible reason of this finding can arise from common usage of computer in all areas from transactions to shopping that is attractive and useful for both female and male. Besides, the related literature about the effect of having computer on attitudes was examined and contradictory results were seen. For example, while some studies confirmed that there was a meaningful difference between computer ownership and attitudes toward computer (Khine, 2001; Taghavi, 2006; Akbulut, 2008), the others stated that there was no meaningful difference between computer ownership and attitudes toward computer (Deniz, 2005; Aral et al.,2006). Moreover, when the studies investigating the relationship between frequency of computer usage and attitudes were analyzed, some studies stated statistically significant effect (Kutluca, 2010; Tsitouridou & Vryzas, 2003). On the other hand, in the study of Gercek et al. (2006) a meaningful difference was not found between frequency of computer usage and attitudes toward computer. These can be derived from the accessibility and availability of computer resource in participants' environment. According to other result of this study, year in program and experience in preschool made a significant difference on attitudes towards using CBE while implementing science activities just only in terms of university type. Similarly, computer attitudes were affected from the variable of the year of study in most of the studies (Pamuk & Peker, 2009; Taghavi, 2006). These differences can arise from participants' self-evaluation about computer usage and freshmen students' not being taking courses about instructional technology, science and school experience in teacher education. In other words, it is found that there is a difference between participants' self evaluation about computer usage and their attitude score towards using CBE while implementing science activities not only in terms of university type but also grade level. Therefore, it should be given effective instructional technology courses in university education which support functional applications instead of general basic information. In addition, pre-service ECE teachers should be trained as how they can use computer and computer based applications in learning environment especially in science activities. Furthermore, universities could have clear vision which aims to graduate students as competence teachers for integrating technology in their classrooms. To achieve this aim, instructors could be given in-service training. Finally, there are some limitations of this study. For instance, the sample size is too small to generalize the results for Turkey and limited variables are analyzed in this study to determine their effect on attitude. To cover these limitations, a larger sample can be used and other variables can be added to examine their impacts on computer attitudes in future research. In order words, this study reflects the influence of selected variables on the computer attitudes of pre-service ECE teachers. Thus, future studies can investigate all perspectives of teacher education and their relationship between pre-service teachers' attitudes, acceptance, and usage of the computer as a tool for instructional purposes and professional development systematically.

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KNOWLEDGE AND RESEARCH BEYOND WEB 2.0: THE CASE OF INVESTIGALOG

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ABSTRACT

This article discusses some of the ways of generation and management knowledge today and the possibilities of the web 3.0. Part of the analysis is completed with the exploration of the relationship between computer technologies and these new views of knowledge. The characteristics of the global information society, in a general framework for access to it to generate knowledge and manage it effectively, result mainly in access for all, empowerment and cooperation for all, under the scheme of collective intelligence. This paper shows a concrete example of web technology to understand and development this field: the Social Website to Know and Research called Investigalog (http:/www.investigalog.com). The aim of this Web 2.0 technology is create knowledge and share what you know with others.

INTRODUCTION

Programs such as the School Plan 2.0, in Spain and in other countries, and other plans and policies beyond our borders such as *Digital Inclusion, e-Inclusion, e-Learning,* or more innovative and avant-garde proposals such as the semantics web, the application of the Artificial Intelligence (AI) to the new web, the *cloud computing,* the OnToKnowledge, etc., in the frame of the *Global Information Society,* clearly mark the road on which the educative intuitions and society as a whole transition to in order to face the challenges of the future, at least they are proposals that link the next syntactic level of hyperspace to the semantic level of new ontology.

The characteristics of this global society of information, in a general frame of access to generate knowledge and administer it in an effective manner are fundamentally translated to: access for all, empowerment for all and cooperation, a new and more significant collective intelligence in the frame of a solvent *crowdsourcing* at a global level.

If we establish the opportune connection between new information technologies and administration of knowledge, it is necessary to point out that between information technologies and communication (TICs) which provide the basic infrastructure for the knowledge management are found, among others, the networks, the information systems, the intelligence search tools and intelligent agents, the data mining, the data-warehousing and the development tools on the internet.

At the same time, the knowledge management remits the collective activities and practices directed to the most efficient acquisition of the ability associated to this knowledge and the correct utilization, which allows one to associate the knowledge that the capacity to understand and interpret the nature of something, a real phenomenon, the laws that regulate behavior, and also, the application of certain abilities. This is resolved as a fundamental element in the correct response to people, whatever their reality may be since it is a mechanism which allows its generation, execution, acquisition, assimilation, transmission, use, etc. and puts it to the service of personal development.

Since the break out of information technologies and, specifically, of web engineering, knowledge management has done nothing more than transform its range and possibilities, noting, moreover, and here lies a paradox, that more information does not mean more productivity (López Gómez, 2009: 43).

The possibility of knowledge management today depends on at least two factors: on one hand, the idea that we have of knowledge, something related to information but distinct from it. On the other hand, the frame of comprehension of this reality is projected as a paradigm supported by the immense development of information and communication technologies, a new paradigm for the generation and administration of this

knowledge. Thinking further, this possibility has just begun the road of its new evolution and, realistically, we can affirm that we find ourselves now in the prehistory of its immense possibilities.

The latter suggests going over covered ground, but also of the colossal road we have ahead to understand that this new paradigm fulfills the demands for being considered as such paradigm or if, on the other hand, we should consider the new knowledge management through the TICs a simple theory, a passing fad, a weak proposal that will not go anywhere due to its lack of solid argument.

KNOWLEDGE MANAGEMENT AND HUMANIZED TECHNOLOGY

All of the aforementioned tools are used to develop systems which make the administration of knowledge possible, understanding this in a wide sense. Thus conceived, one must highlight the series of possibilities for these tools, which confer their power to human hands. The diversity of functions has been studied, among others, by Davis, Fensel and van Harmelen (2005), Ponjuan Dante (2007), Aguaded and Dominguez (2009).

These technologies have contributed to the rupture of the pyramid model of knowledge, which is considered obsolete in time which the participation and the creation elaborate contents by the actors of the formative process (and elaborative knowledge) is augmented and universalized by equality (Manfredi, 2009). However, this trajectory is not produced linearly, but rather is interrupted and with problems due to the digital breach on one hand, and on the other, because the system is installed on the syntactic level, a place where the user can not substitute the process of thinking, contrasting and verifying with these tools. The matter lies in whether the semantic web, with the help of AI, could resolve these problems.

Nevertheless, the direction produced from the interpretation of the new idea of knowledge undermines the idea that the objective related to the institutions of learning, for example, universities, not only knowledge, understood as a collection of stored data, but rather also the knowledge and the social influence. If people connect, relate with one another, and experience all this as a context and a process, then we find ourselves before a new idea of knowledge and before new demands for technologies that won't stop suggesting it.

In human hands, at our meeting point, the question is that since its origin, both the growth of information and the productivity were linear, a tendency that was consolidated since the web 2.0. Nevertheless, for Lopez Gomez (2009: 43) this line is found at the stage of descent, that is, <more information, less productivity>.

The explanation of this phenomenon is very simple: <our level of uncertainty has grown due to the increase of unorganized information and its weak structure> (Lopez Gomez (2009: 43). An example illustrates this matter even more. In order to accede any data through a search engine the usual problem forms of being a syntactic search and fundamentally guided by reserved words, the majority of the time, bringing undesired results requiring a major human intervention in the labor of interpretation of the results.

The humanized technology has run out possibilities up to a certain point – the web engineering is returning the capacity to pass form the syntactic to the semantic. It is not an easy step, they must follow a series of conditions and, above all, bet on the hypothesis that the computers can not only process the data, but also understand it, realizing automatic reasoning (Ding and others, 2005). We are on the cusp of the semantic web or web 3.0, which will transform the web from a "descriptive logic", from an information space (simple humanization of the web) to knowledge space (complex humanization).

HUMAN TECHNOLOGY AND THE FUTURE OF THE MIND

Just as Berners-Lee and others (2001) conceived it, a web of interlaced data is considered superior to current machines and digital interlaced resources by means of URLs. In an exercise of prospective, and greatly simplifying, the prediction of the kind of changes that the semantic web could contribute to is centered on at least two of these transformations (Codina, 2009: 10). 1) Changes related to Artificial Intelligence; 2) Changes related to information processing.

The first group, which we have identified with AI, it believes that in the future computers connected to the web through complex systems of metadata, ontology and formal logic could produce *reasoning* at the service of the user. The limits of this reasoning are unclear. Possibly, software agents representing users could do the work that today only humans can successfully accomplish.

The second group, which we identified with the information processing, is skeptical about the possibilities of AI if it recognizes and values the great benefits that the semantic web project could contribute to the new web.

The semantic web means to provide documents of information and semantic structure as an explicit way of achieving information systems, from this point on *agents,* can understand the texts (Berners-Lee and others, 2001). Perhaps this is the genius of the new web engineering: the web pages as well as documents could be data destined for the computer. Tim Berners-Lee, the creator of the concept of the semantic web, understands that this is an extension of the current (not one separate and new web), where the information is provided from a well defined meaning, the computers are better equipped and people work in collaboration.

None of these ideas are petty expressions, all project the dimensions of the new idea of technology, knowledge and human development: they provide the human language technologies, the development of AI o quasi-artificial with intelligent software agents and new meanings for the knowledge that the human being generates and administers, which produces the sense of connection and interaction with the machines, computers that *reason and comprehend* (Cunningham, Bontcheva and Li, 2005; Uren, 2006; Java and others, 2007).

In the sphere of contributions of these technologies and the relation to the knowledge and the multiple possibilities for its administration, the appearance of the Intelligent Software Agents (ISAs) supposes a further step into the virtual and virtuosity of the new technologies.

The term agent was used for the first time by Minsky (in his work, *The Society of Mind,* 1985). Here Minsky defined the possibilities of AI and the evolution of the mind, trying to explain the future of the mind associated with these phenomenons which sprouted in the 1980's and today are a reality in evolution, a reality upon which we must project new hypothesis, which in many cases, has exceeded the conjectures launched in the beginning.

Currently the word "agent" has many different meanings since it is used in very different fields. We have independent, biological, robotic, computational, artificial life, software, specific duty, entertainment, and virus agents.

Concretely, the ISAs are pieces of software that act in an independent manner in the networks in the name of the user. They are based on the behavior of the person, or at least, determined by him/her, which entails, according to the changing behavior and diverse necessities of the person, an instrument of great importance surfacing in order to interactively respond correctly and without objections.

The models of AI have been recreated to try to explain the behavior of these software agents, when the conclusion has been reached that the so-called quasi-artificial intelligence is the one that best allows the symbiosis between the machine and the human being.

Marvin Minsky (2006) himself, in his work *The Emotion Machine*, affirms that once we recognize that our brain contains a very complex and complicated machinery, we must then try to find more complex ways to explain our most familiar events, further from the simple explanation that can represent a reduction for the matter at hand. In the end the explanation of the phenomenon is as simple and as it is intelligible.

What he suggests is a new semantic to tackle the question, the one that has been contemplated until now is insufficient. This is reason for which Minksy explores, with very important contributions, in the terrain of development of the graphic, symbolic description, computational geometry, representation of knowledge, computation semantics, mechanic perception, and symbolic and connectionist learning. The development of the human sense in relation to machines or by machines or by going beyond these means, has its place in this new context, although it already began with authors like Jerome Bruner (1984, 2006), who proposed new cognitive foci for the description of human learning.

Thus, to explain the contexts of production of the senses, a genuine source of the production of meanings, Samaja (2008) resorts to the notion of "macro semiotic", which is understood as *large reservoirs of signs*. Upon conceiving the cognition as a process of semiosis, that is, a production, distribution and reproduction of meanings, Samaja also centers his argument on the problem of the subject, and in relation to it, that of the cognition as a faculty of attribution of meanings or interpreting the world through signs.

In both authors one can sense an unavoidable position regarding knowledge, or about the notion of the "mind", since both presume and "active" role of who knows and an attitude of obligation or action oriented to "interpret" a situation. Therefore, the self awareness cannot explain the notion of "reality". In this sense, it must be noted that Samaja as well as Minsky accentuate the conception of *thought and reality* as two

dimensions of one process, which we could call the process of "the birth of the world" beginning with the intersubjectivity which defines the subject in the situation.

The idea of man in Samaja is an analog of the unfinished, unconcluded, incomplete man whose existence is resolved to "grow all the time". Tools like software agents or, in general, human technology tools for knowledge, can be seen as tools for the mind (Wertsch, 1993), because they support a determinate manner of action for the thought process, in the present of certain unpredictability where the future of the mind will set the stage and the conditions of the machine-human being relationship. Moreover, the theory suggests that our contact with the tools has created a certain type of mind, both in its structure and in its function; therefore it makes sense to ask the question with Minksy about the future of the mind in its new relationship with machines.

SOFTWARE AGENTS AND THE EVOLUTION OF THE MIND

The term "agent" describes an abstraction of software, and idea or concept, similar to the methods, functions and objects in the programming oriented to objects. The concept an agent provides a convenient and powerful way of describing a complex entity of software, which is able to act with a certain grade of autonomy, to carry out tasks in representation of people. But differentiating from the objects (which are defined by methods and attributes), an agent is defined by its own behavior. If the model we apply is the human, we talk about the unpredictable character of this behavior, the idea that c*ontinual growth* takes on a singular force.

In a generic sense, the properties of the agents can be summed up in the following ways: reactive, autonomous, oriented by objectives, temporally continuous, communicative, learning, mobile, flexible, character. Its typology usually varies from one author to the next, a typology based fundamentally on three characteristics: cooperative, autonomous and learning: collaborative agents, interface agents, collaborative learning agents, smart agents.

One of the virtues of the software agents is that its applications are numerous. We must highlight among others: the use of agents in internet and interfaces of users, the use of systems information, games and animations, electronic commerce, education, etc.

Specifically, in the sphere of the web, considering the network of networks will continually grow and without great obstacles until it shapes an essential tool in the vital development of the human being, we can point out the following types of agents: autonomous, intelligent agent, user agent…

The Intelligent Agents are the ones that use AI or the frame of comprehension that projects the quasi-artificial intelligence as learning and reason. These two ideas show their importance inasmuch as that of independent way to have the capacity to learn and to adapt (Dini, 2003). But, coming back to the idea of an intelligence that is not totally artificial, these agents always need the impulse of the external mind which in its interaction orders a determinate action or a collection of tasks, interactive bilateral relationship that provides permanent learning to the agents of the binomial human-machine.

For this reason the current model of quasi-artificial intelligence is better materialized for the comprehension of the intelligent software agents. That is, the agents learn by trial and error, by introspection and analysis of the behaviors and events, also through example and generalization. That is to say, the software agent, through the election of certain algorithms or by strategy selection to resolve a problem responds to the capacity of success of the requirements of the external personal agent that initiates it or with the one who interacts.

The necessary process of transmission between distinct versions of the web (1.0, 2.0, 3.0), a transit that is produced from the centralized vision to the level of the user and from the syntactically expressed contents from a natural language, to decentralized states through the use of technology of human language en contents in the form of data with semantic value for the computer, is produced thanks to new algorithms of learning, supervised (classification and categorizing) and unsupervised (grouping), all depending on the best techniques of the AI and the use of these intelligent agents.

More concretely, the advances in automatic learning, multi-agent systems, reasoning based on cases, satisfaction of restrictions and person-machine communication, among others, mark the progress of the new web (Lopez Gomez, 2009) and, consequently, the evolution of the mind, thought processes and consciousness.

INVESTIGALOG ON THE WEB 2.0

As Samaja affirms (2008: 15), <the 20th Century has consecrated the idea the question of *doing* is more profound than the question of *being*. In particular, the Epistemology has set aside the question of "the being of Science", to ask itself "what does Science do?" and in that sense the Methodology has ended up coinciding with the Epistemology>.

Today the problem affects the way which science is done and the way it is taught. Crediting the same Samaja (2008) the possibility of teaching science, but warns that one must add an important requisite so it is viable: that the fundamental object of teaching, not the transmission of methodological precepts but rather the comprehension of the process of research: *that is, the comprehension of the origin of its product*; of the function of its procedures and of the *conditions of execution* which pass.

The importance is a given because it incorporates not only the possibility but also the need that science be more reflexive, that all participants be more reflexive (Gibbons *et al*, 1997). This is due to the fact that the subject on which we base our investigation cannot be answered only in scientific terms and techniques, the solution to the problems will inevitably affect the values and preferences of different individuals and groups who have been considered traditionally on the margin of the scientific and technological system.

Gibbons *et al* (1997) describes, for the critical comprehension of these suppositions, the difference between *mode 1 and mode 2 of knowledge production*. The evidence seems to indicate that the majority of the advances produced in science have been executed by five percent of the population of active scientists (Gibbons *et al*, 1997: 11). This is what we could situate in mode 1 of traditional production of knowledge, generating within a disciplinary context, fundamentally cognitive. In contrast with this mode of production we find mode 2, which comes created in wider social and economic trans-disciplinary contexts. Resuming:

Mode 1 pursues combining in a single phrase the cognitive and social norms that should follow in the production, authentication and diffusion of knowledge of this kind. Its cognitive and social norms determine what will be considered significant problems, who should be permitted to practice science and what constitutes good science. The forms of practice that adhere to these rules are, by definition, scientific, while those others that violate them are not.

Mode 2 of knowledge production is carried out in the context of application. In the same way the configuration of the final solution will be further ahead than any individual discipline that contributes to it, being thus, trans-disciplinary. Another characteristic is that in mode 2 the production of knowledge is heterogeneous in terms of abilities and experience that people bring to it. Organizationally mode 2 is heterarchical and transitory and more socially responsible and reflexive.

Being that, mode 2 critically depends on these emergent computational technologies and on new telecommunications, and favors those that can be permitted to use them. The interactions between those places of knowledge have set the stage for an explosion in the number of interconnections and possible configurations of knowledge and ability. The result could be described as a social system of distribution of production of knowledge.

This communication between what is science and society, through a true idea of what is epistemology and the possibility that society earns prominence in the creation of knowledge and that this is redistributed among the initial actors and others, are ideas that assist as foundations in the origin of Investigalog.

The basic idea is to create awareness of a platform in which knowledge can be freely expressed within reach of everyone. It gives the user the possibility of creating knowledge and sharing with others in an accessible open space (Nafria, 2007).

Given the aforementioned tools that exist in the knowledge management, Investigalog is a platform oriented to the creation and transfer of entitled knowledge for any person that needs to administer their knowledge through the creation and or acquisition, as well as fomenting the relationship between users and the same or of different fields, contemplating the trans-discipline as a fundamental element.

More concretely, Investigalog is characterized by generating determinate potentialities, among which stand out:

- It allows the user to express his/her knowledge without any type of restriction. The judgments about the quality of work are expressed by society as a whole, as it is to society that the generated knowledge is directed. Operatively, the concept of society can be expressed in

smaller groupings that we can call communities, contemplating these as groups of people flexibly related, open and of porous rules, whose fundamental responsibility is the contribution with its contributions to the growth of knowledge through these states of intercommunication.

- It allows that its knowledge is found within reach of everyone. It is an open system - the knowledge is organized in a simple manner so that it serves as a means of social of usefulness and functionality.
- It foments the relationship between users of different fields, thus easing the diversification of knowledge and its possible interconnection. In the vision of science as a complex field which should be studied in a complex manner so that it can be easily understood, it is necessary to use platforms, in a real or figurative sense, since the ones that we can use in relation to knowledge and content agents, in an integrated way, to provide that which has been described in the paradigm of learning and automatic processing which has inspired how biological information systems work.

This last characteristic, which can be derived from the functioning of an information network, leads to the understanding that the system is composed of units called neurons. Each neuron receives a series of entrances through interconnections and emits an exit. This exit has three functions: propagation, activation, and transference. Investigalog and the web 2.0 allows one to connect knowledge and content agents, in a way that in the interconnection throughout the phases of interchange and relationship one can produce networks that collaborate to produce a stimulus of exit, being this the acquisition of knowledge, the resolution of a problem, the learning of a skill, etc.

Thus, Investigalog is a tool at the service of any field of learning and knowledge. All areas are susceptible to be worked in this way to understand science, including narrative, essay, poetry, and journalism. In this way work is included from biology, health science, humanities and social sciences, chemistry, physics and math, engineering and management systems and legal and economic sciences.

In his analysis about the limits of knowledge, Ronald Barnett (2001) affirms that we still do not have a superior education for the society that learns. In the background of his reflection we find the following debate: if what concerns us is a society that produces, then the possibility exists of not being concerned about a society that learns. Thus, a society that learns <is not even on the horizon, including in the narrow meaning that has given "learning" of "the society that learns". Production still reigns> (Barnett, 2001: 245).

Despite proving that society is changing and that individuals will be forced to continually renew their cognitive state, that is to say, continue learning, we can prove with frequency that this appreciation is quite ambiguous. On one hand, with the necessary modesty but with precise determination Investigalog aspires to this new academic ethic, just as Duke (1992) understood, that one should generate learning, better characterized by meta-learning, seen as a critical disposition for analyzing self-learning.

This means that one should keep up a continuous active learning, in which one's own projects and practices are evaluated by one self and discarded when necessary. The verifications are open and also subject to evaluation. The learning, for that reason, is a learning of oneself, carried out in a rigorous manner. It is a never ending process.

The rest of this process of collective intelligence will be, through the semantic web, to achieve that the contents be explicitly equipped of semantics so that, from that point, the agents are able to deduce and infer knowledge.

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LEARNING APPROACHES OF UNDERGRADUATE COMPUTER TECHNOLOGY STUDENTS

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ABSTRACT Students' performance is an indicator of the kind of approach (deep or surface) that is taken. This study investigated the different approaches used by undergraduate students at the Computing School using the Biggs (2001) Revised Two-Factor Study Process Questionnaire (R-SPQ-2F). Sixty-three students participated in the study. Results showed no significant difference between the types of approach by the demographic variables of gender, nationality, year of study, and degree major. However, the rank ordering of the mean value indicated that almost every one of the students participated in the study were somewhere in between deep and surface and clearly did not possess deep approach to learning. The lack of deep approach to learning among students was attributed to factors such as conditions of learning, professional capacity of teachers, and the lack of instructional rigor in the program or coursework.

KEY WORDS Higher education; computer technology students; learning approaches; Malaysia

INTRODUCTION

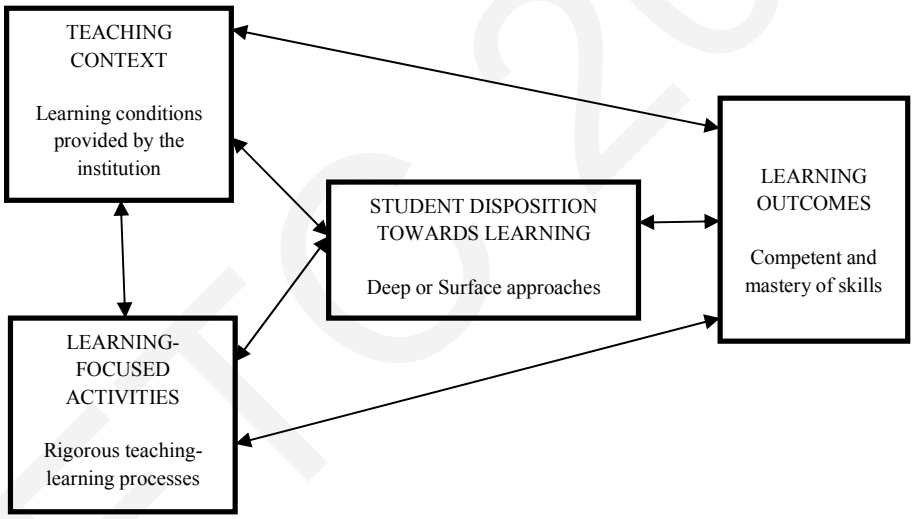
There has been growing concern about the quality of graduates produced by public and private Higher Education Institutions in Malaysia. They are criticized for producing graduates who lack qualities such as critical thinking, an aptitude for self-managed learning, reflective thinking, ability to solve novel problems at the workplace (Khoo, 2001; Koo, Pang, & Mansur, 2006). A tracer study by the Ministry of Human Resources Malaysia conducted in 2006 shows that 30.7% of graduates remained unemployed six months after their graduation while 5.6% were still awaiting job placement (Tan, 2007). Some of the reasons attributed to this situation are graduates' lack of generic skills, inability to communicate effectively via written and oral presentations, inability to participate in problem-solving activities, disinterest in scouting for new ideas, and narrow view of the issue at hand, and resorting to quick fixes. The concern about employability of local graduates and their attributes linked back to the quality of higher education (Woo, 2006). And this leads to the question of the curriculum, teaching methodology, course structure and content, learning environment, quality of teaching and teachers, and student context and disposition towards learning.

Among the numerous competencies expected by the employers, competency in Information and Communications Technology (ICT), business communication, critical thinking, and problem solving skills at the workplace top the list (National Higher Education Research Institute, 2007). While the expectation of the government and the private sector is increasing, the quality of student performance at the colleges is not encouraging. For example, student performance at the Computing School at one of the private university colleges under study has not been improving since 2008. What is the reason for this performance stagnation? Are the students really interested in studying, is there a conducive learning environment that can boost student motivation to learn, or are there any other problems related to the teaching-learning process that are hindering their learning capability? These are some of the questions that needed to be answered in order to help them improve in their intellectual capacity and work performance.

THEORETICAL FRAMEWORK

Student's approach to learning, either deep or surface, is considered a factor that influences the learning process and outcome of a student (Biggs, 1987, 1999; Biggs, Kember, & Leung, 2001). Biggs and colleagues (2001) in their '3P' (presage-process-product) model of teaching and learning explain how the students' approaches to learning can be seen as a total system where student factors, teaching context, learning-focused activities, and the learning outcomes mutually interact. The students' prior knowledge and ability, teachers' pedagogical content knowledge, nature of the curriculum, methods of assessment, the institutional climate and procedures interact to determine the on-going approach to learning which in turn determines the output. Figure 1 that is adapted from the '3P' model of teaching and learning shows that the teaching context, the learning-focused activities influence students' disposition and drive towards quality learning. They are mutually linked and together they produce the desired learning outcomes. The moment the teaching context is changed and the teaching strategies are aligned towards creating a deeper approach to learning the students' preferred approach can also change causing an impact on the outcomes.

Figure 1 Teaching context, learning activities, and student outcomes



Adapted from the '3P' model of teaching and learning by J. Biggs, D. Kember, & D.Y.P. Leung (2001)

METHOD

This study was conducted in the Computing School at one of the private university colleges in the Klang valley using Biggs's (2001) Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) to explore students' approaches to learning from the student's perspective. This instrument measures two latent variables: a deep approach to learning and a surface approach to learning. The deep approach latent variable was indicated by two observed variables (Deep Motive and Deep Strategy sub-scales), while the surface approaches latent variable was indicated by another two observed variables (Surface Motive and Surface Strategy sub-scales). The items were rated on a Likert scale (1— never or only rarely true of me, 2 —

sometimes true of me, 3 — true of me about half the time, 4 — frequently true of me, 5 — always or almost always true of me).

Respondents for this study included undergraduate students enrolled in the Computing School, undertaking courses in Information Systems, Information Technology, and Multimedia Systems. Questionnaires were distributed to all the 200 students in the Computing School. Out of the 200 questionnaires distributed, 63 were returned as completed ones. The sample distribution according to gender, nationality, year of study and degree major is given in Table 1:

Table 1 Demographic information

Gender		Nationality		Year of Study			Degree Major		
Male	Female	Local	International	Year 1	Year 2	Year 3	Info Systems	Info Technology	Multimedia Systems
49	14	39	24	33	19	11	40	14	9

FINDINGS

Independent *t*-tests and one-way ANOVA analysis showed no significant difference between the types of approach used and the demographic variables of gender, nationality, year of study, and degree major However, the rank ordering of the mean value indicated that almost every one of the student participants in the study were somewhere in between deep and surface and clearly did not possess deep approach to learning. As a first step in the analysis, the mean score value was found for all the 20 items. The cumulative mean value for the 'Deep Approach' items was 3.01 (Table 2) and the cumulative mean value for the 'Surface Approach' was 2.91 (Table 3). These two mean values indicated that the students in the study did not fall strongly on either the deep approach side or the surface approach side. They were mainly in the middle indicating that this was true of them half the time and not always. This result indicated that activities focused on learning could be few, and the teaching context not very supportive of developing students' deep learning.

Table 2 Deep approach to learning

No	Deep Approach Items	Mean Score	*SD*
1	I find that at times studying gives me a feeling of deep personal satisfaction.	2.89	1.05
2	I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	3.27	1.00
5	I feel that virtually any topic can be highly interesting once I get into it.	3.22	1.05
6	I find most new topics interesting and often spend extra time trying to obtain more information about them.	3.29	1.16
9	I find that studying academic topics can at times be as exciting as a good novel or movie.	2.76	1.17
10	I test myself on important topics until I understand them completely.	3.14	1.08
13	I work hard at my studies because I find the material interesting.	2.98	0.99
14	I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.	2.86	1.18
17	I come to most classes with questions in mind that I want answering.	2.71	1.05
18	I make a point of looking at most of the suggested readings that go with the lectures.	2.97	1.05
	Deep Approach (DA) = 1 + 2 + 5 + 6 + 9 + 10 + 13 + 14 + 17 + 18	**3.01**	

Table 3 Surface approach to learning

No	Surface Approach Items	Mean Score	*SD*
3	My aim is to pass the course while doing as little work as possible.	2.83	1.39
4	I only study seriously what's given out in class or in the course outlines.	2.95	1.22
7	I do not find my course very interesting so I keep my work to the minimum.	2.65	1.12
8	I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.	2.97	1.08
11	I find I can get by in most assessments by memorizing key sections rather than trying to understand them.	2.97	1.03
12	I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.	2.98	1.13
15	I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.	2.79	1.11
16	I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.	3.05	1.13
19	I see no point in learning material which is not likely to be in the examination.	3.08	1.26
20	I find the best way to pass examinations is to try to remember answers to likely questions.	3.16	1.08
	Surface Approach (SA) = 3 + 4 + 7 + 8 + 11 + 12 + 15 + 16 + 19 + 20	**2.94**	

DISCUSSION

From the results of this study, it is evident that the students from the Computing School were not adopting the deep approach fully in their learning. The reasons for such learning behavior of students can be attributed to three inter-related aspects, namely, the student factor, the teaching context, and the learning activities or the tasks (Biggs, 2001). The student factor may include the prior knowledge or past learning experiences of students that determine the kind of approach they bring with them. The teaching context may include the learning objectives, the assessment methods, school climate or the ethos, the pedagogical practices, and the institutional procedures. And the learning activities refer to the tasks that are assigned and the quality of teaching-learning process that is happening. The activity of uplifting students towards deep approach is a multi-level task. It involves the creation of learning conditions that challenge students' critical thinking and creative ability, teachers who are competent in providing deep and meaningful learning activities that may provide rich learning experiences, and rigorous instructional practices that are engaging and challenging to students.

Learning conditions

Two conditions – 'internal' and 'external' are said to determine student learning (Dewey, 1964). Students' motivation and the teaching-learning environment were found to be the two influencing factors in students' approach to learning (Howe, 1999; Kember, Charlesworth, Davies, McKay, & Stott, 1994). It is critical that an educational institution aiming to cultivate deep approaches among its students look into developing the motivation and aspiration for high quality academic achievement. The press for higher standards is usually accompanied by increased number of assignments, long hours of reading, library research, and more in-depth analysis of subject matter. This can be a daunting experience to many and personal support of teachers can be helpful in keeping student morale and motivation high. Personal encouragement, positive reinforcement, affirmation of student work, and genuine concern shown can help build students' motivation to strive for higher quality learning and better outcomes. In addition to the internal conditions, it also becomes the

responsibility of an educational institution to provide the appropriate physical, psycho-social, and cultural support to the students. An environment where students feel 'safe' to explore and experiment with new ideas and provided with platforms to share and voice their opinions freely can allow the development of deep approaches among students. Academic dialogue sessions, seminars, discussion groups, invited speaker sessions, forums, and symposiums can provide the opportunity for stimulating intellectual robustness and deep approach towards learning.

Professional capacity

Teachers are the driving force behind any successful learning activity. Their quality of education, level of preparedness, and positive disposition become the determining factors in helping students achieve deep approach in learning (Kember, 2000). Teachers' knowledge base grounded well in subject matter knowledge, curricular knowledge, pedagogical knowledge, and knowledge about the learners and their contexts are central to effective teaching and learning (Ball & Forzani, 2007; Darling-Hammond & Bransford, 2006; Grossman, 1990). Competent teachers who possess specialized content knowledge formulate rigorous instructional activities, deliver it in engaging ways, design assignments that will challenge students to question their own thinking processes, encourage metacognitive analysis, motivate students to master higher order thinking skills and apply them to solve complex problems (Ball, Thames, & Phelps, 2008). Clearly, recruiting and developing teachers who are competent are crucial to ensure the supply of expert academic members for developing deep approach in students.

Instructional rigor

Academic depth and rigor is clearly a critical element in the development of deep approach in learning among students. This can be achieved by establishing a coherent instructional practice focused on explicit students' learning outcome, a detailed description of the high quality instructional procedures that will lead to the attainment of learning outcomes, materials and associated tools relevant to instruction, and assessment methods that will contribute towards deep approach in student learning. The organization of the curriculum content aligned with the learning outcomes, and the instructional strategies with the right kind of materials and general pedagogies can result in a rigorous teaching- learning experience. The rigor of learning can be further enhanced through applying the assessment methods that are focused on developing deep approaches. The quality of the learning tasks assigned, assessment method used, types of work asked to be produced and how they are graded and supplied with feedback can improve the overall instructional practice and student learning outcomes (Biggs, 1987; Dornye, 2000; Jacobs & Newstead, 2000). The high-quality instructional practices that are intellectually engaging and challenging will create the opportunity for developing deep approach among students (Gijbels & Dochy, 2006).

CONCLUSION

Students must depart from the surface approach to learning that is focused on a narrow target and rote method and strive for deep approach to learning which pushes for maximization of meaning and conceptual understanding of a subject. It is not sufficient that students merely pass an examination; they must be able to fulfill the intrinsic interest to acquire in-depth knowledge for better performance. But student learning is influenced by a number of factors such as students' values and motives, their perceptions of task demands, teaching and assessments methods, the teaching-learning climate, teacher preparedness and the quality of institutional procedures (Biggs et al., 2001). Students' shift from surface approach to deep approach in learning can be achieved by improving the conditions for learning, raising teacher professional capacity, and scaling up the instructional rigor of programs offered. Improvement of students' motivation and morale, and

the physical, cultural, and psycho-social support provided will improve students' approach to learning. This can be enhanced further with the teachers who are better prepared in their specialized content knowledge as well as pedagogical content knowledge to elevate students' learning. Scaling up of the instructional routines that include the appropriate methodology and assessment is also an important component in developing the students' deep approaches to learning. These three aspects done with care can help bring about positive changes in the teaching-learning process and the students' deep approach to learning and better outcome.

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LEARNING MANAGEMENT SYSTEM DESIGN AND ANALYSIS PROCESS

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ABSTRACT

Today, students who studies at undergraduate level, need education that independent from time and space because of their life together with education and business. This situation brought about the need for students to use technology. So, supporting formal education or as another alternative to formal education, the importance of web-based education has increased steadily.

In this study it is intended to bring the solution to this requirement with a developed software platform. The software provides education on the internet. This software is a solution of all educational stages as students' system registration, education process and assessment of student achievement with a variety of test modules. So that allows students to receive education as synchronous or asynchronous and aims to develop a solution to the negation which is brought by formal education environment.

INTRODUCTION

Today, with the development of information technologies, necessity of knowledge transfer more fast, more detail, more secure and more quality, as in all areas in the field of education has become a necessity. Specially, increasing number of student-workers at undergraduate level leads to choose these student-workers open education or distance education rather than education that depending on an institution but performed formally. Thus, the dependence on space or time in education has been eliminated.

Online course development tools and assessing service providers is not an easy assignment. As well as instructors and students have different necessities depending on the situation, for the facilities that will be discussed there are countless factor, hundreds of features and benefits. A school that introduces a solution for campus-wide usually requires a complex infrastructure. (Karakuzu, 2004)

At that point teaching management systems is seen as a solution. Learning management system is used for ordering online learning environment. (Macromedia, 2003) E-learning brings innovation to the concept of learning, with the approach ‘’where, when and how you want to learn’’. (Duran, 2008). The usage of internet as an education tool can be a solution proposal to eliminate time and space dependency of education as well as to eliminate negations of school environments for instructor and students.

The most prominent feature of formal education is face to face communication between instructor and student. This type of education is generally organized for common level of group rather than different types of intelligence and learning skills. However, ideal education system is prepared by taking into consideration each student's personal characteristics. This system, which is hard to put into practice by formal education principles, is put into practice by distance education and comprehensive education management systems. Distance education is the cheapest system among other education systems, when there are enough students to cost investment in formal education. (Çetiner, 1999).

Web Based Instruction

With the development of internet, web has become a powerful, global, interactive and dynamic information sharing platform. Web provides new possibilities which cannot be realized before, for students. Hence, all the students in the world can access to resources equally. Information age has a great influence on our education system. Innovations in information age bring new concepts to education. This new educational concept brings rich learning environment supported by well-designed resources. Web can be used for a new learning and teaching tool for creating such a rich learning environment. (Bay, 2005)

Web based teaching is a hyper-media based teaching program that uses sources on WWW for creating a significant learning - teaching environment where learning is encouraged and supported. (Özarslan, 2007)

Learning Management System

Learning management system (LMS) is a management software platform that provides sharing of course content and materials designed for educational purposes, sending and collecting of homework, statistics about attendance of students and the level of success, and online communication. (Hayran, 2010)

Learning management systems offer education content for learning activities, personalities, study environments, learning capabilities and content delivery policies. Learning objects are used for clarity of education content and meet the expectations and needs of individuals. Learning objects are the smallest, independent, structural and modular particles of content. Because learning objects are reusable, they must be independent from the platform which they are distributed.

Learning Content Management System

A learning content management system (LCMS) is a related technology to the learning management system in that it is focused on the development, management and publishing of the content that will typically be delivered via an LMS. An LCMS is a multi-user environment where developers may create, store, reuse, manage, and deliver digital learning content from a central object repository. The LMS cannot create and manipulate courses; it cannot reuse the content of one course to build another. The LCMS, however, can create, manage and deliver not only training modules but also manage and edit all the individual pieces that make up a catalog of training. LCMS applications allow users to create, import, manage, search for and reuse small units or "chunks" of digital learning content and assets, commonly referred to as learning objects. These assets may include media files developed in other authoring tools, assessment items, simulations, text, graphics or any other object that makes up the content within the course being created. An LCMS manages the process of creating, editing, storing and delivering e-learning content, ILT materials and other training support deliverables such as job aids.

LEARNING MANAGEMENT SYSTEM DESIGN PROCESS

Learning management system, which are used for implementation of e-learning, are software platforms that provide the management of learning activities. These systems also provides presentation and editing of learning material, sharing and discussing of learning materials that presented, managing of course catalogs, taking of homework and exams, giving feedback about homework and exams, keeping record of student, instructor and system, and taking reports.

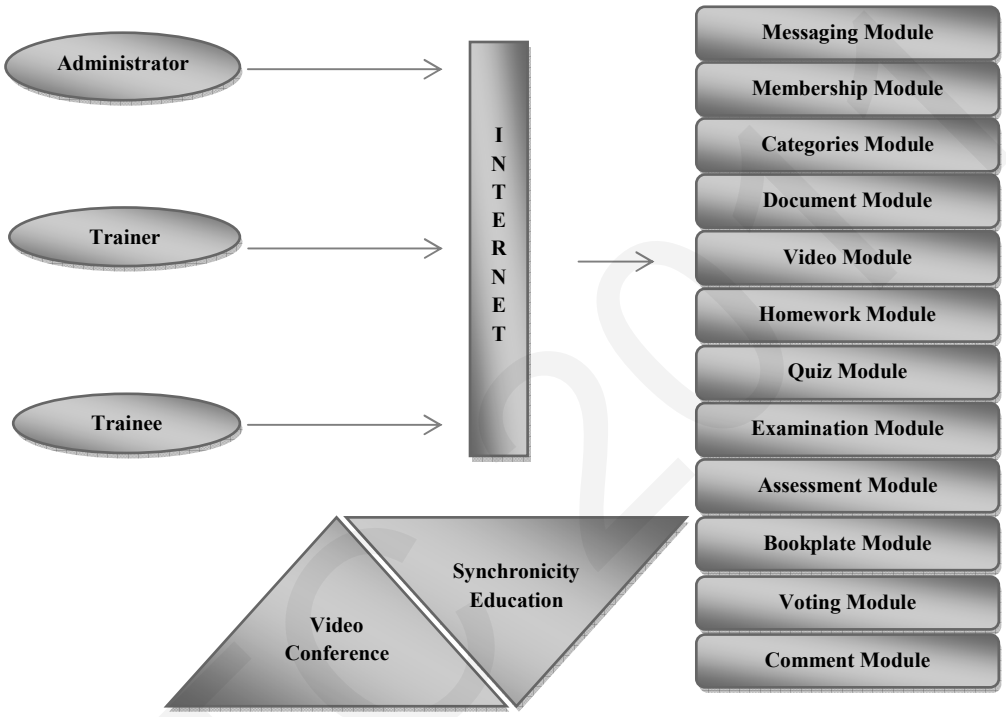

Fig. 1. e-Learning Management System Block Diagram

In the creation stage of project, the needs of students and instructors are examined and a learning environment, which is independent from time and space, is designed. System has a Content Management System feature for being adaptable for presentation of any of the courses. Therewithal, the feature that leads education of students, on the basis of these contents, is a Learning Management System.

Above all, more interactivity is aimed at this application. Thus, highness of student interest and, as a result, highness of the student's success can be provided. Students can reach the content within the system at any time they want and utilize resources freely. Combined with cost advantages, the provided flexibility allows the formation of an ideal model. (Carswell, 2002)

The content of a course to be taught will be determined by the instructor. The specified content will be assigned to student. Not only content, homework and exams will also be determined by the instructor and assigned to students. Thus, instructor will be able to follow student's works via the system and help the student in need.

All Modules in the e-Learning Management System

Module	Explanation
Membership Module	The instructor and students to become a member of the system and to limit the authority provides access to the system.
Messaging Module	The instructors for students in public or private, to send messages and make announcements, send a message to the students to each other.
Categories Module	Lesson plans and the contents of nested grouped into categories, the content of this training the students will be served.
Document Module	Course content categories on the basis of the installation of the system, allows students to download and use and reporting of students use of the document.
Video Module	Installation of the system study the contents in video format, downloaded and used by students and provides students reported the use of the document.
Homework Module	The system allows uploading papers of the students by students and the trainers can download and examine the papers.
Quiz Module	During the e-learning, the system provides quizzes which as a test form.
Examination Module	Students are examined on the web site. The system allows entry of exam questions according to their degree of difficulty by trainer with an administration panel
Assessment Module	Provides entries of Homework, Quiz and Exam module the evaluation by trainers by a management panel.
Bookplate Module	The module provides training contents outside of the categories and one or more categories associated with the subject and filtered.
Voting Module	The contents can be voted by students, this contents how much useful for students can be detect and reporting by the results.
Comment Module	The module provides to making comments and share information to students and educators about the training content.

E-Learning Application

With the help of the modules developed, it is aimed to realise the learning process over the internet in accordance with the aims and objectives of distance education. The modules placed in the Table 2 are application which is aimed to realise the learning process over the internet between student and the teacher simultaneously via the web site of the institution.

Application	Explanation
Video Conference	By performing real-time speech and video over the web site, allowing trainers to make their students practice orally.
Synchronicity Education	Supporting training with video conference at real time over web site.

LEARNING MANAGEMENT SYSTEM ANALYSIS PROCESS

Fig 2 : e-Academia Trainer and Trainee's Application Menus

The menus in e-Academia Learning Management System, which are created for students and instructors separately, indicated in Figure 2. On the page that is created for instructors, in the "User Management" menu, instructors can monitor students' information and make changes in the areas that are allowed by the administrator. In the "Category Management" menu, the instructor can monitor and edit fields and courses that related to the fields. In the "Content Management" menu, instructors can upload content to the courses and assign these documents to students. In the "Content Comment Management" menu, the instructor can monitor, confirm and delete comments that are made on contents. In the "Audio Recording Authorization" menu, audio records, which are recorded to the system by the instructor, are assigned to the courses and it is determined that which students can access these records. In the "Homework Evaluation" menu, instructors can grade students by checking the homework which students enter to system. In the "Exam Operations" menu, as in the sub-menus, instructor can create questions, which can be different types of questions such as classic and test, create exams that are made of these questions and evaluate these exams when they are done. In the "Video Conferencing" menu, the instructor can create invitations for video conferences and can perform courses in an interactive way in "Conference Rooms". In the "Student Statistics" menu, instructors can view the success level of students and the rates of system utilization statistically.

On the page which is created for students, In "Documents" menu, students can download course contents that are assigned for themselves by the instructor. In the "Homework" menu, students can monitor homework that is defined for themselves by the instructor and when they finish their homework,

they can upload their homework to system via the page that is under the menu. In the "Video" and "Audio Files" menu, students can download video and audio files that are assigned for themselves by the instructor. And finally, in the "Exam" menu, students can finish exams, that are defined for themselves by the instructor, on day and time which is designated by the instructor.

RESULTS

The care is taken for designed learning management and content management system to be flexible, practical, easy to use and functional both for instructors and students. With the application, it is aimed to continue and complete education process independently from time and space and efficiently at the same time. As much as meeting the instructor and student at different times and spaces which are created by the instructor for student, carrying out the education process simultaneously via video conference is achieved. This situation increases education quality because of increasing in education interactivity.

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LIBRARY AUTOMATION DESIGN FOR VISUALLY IMPARIRED PEOPLE

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ABSTRACT

Speech synthesis is a technology used in many different areas in computer science. This technology can bring a solution to reading activity of visually impaired people due to its text to speech conversion. Based on this problem, in this study, a system is designed needed for a visually impaired person to make use of all the library facilities in Sakarya University. Certain number of books in the library is transferred in digital media via a scanner and they are transferred into their own server. A visually impaired person can use the system with the help of sound orientation of the program and the keyboard commands of the user. System will be developed according to new requests. So, the purpose of this study is to bring a solution to the social problem of visually impaired people.

1 INTRODUCTION

Speech is one of the methods for providing communication between people. The production process of human speech by an external computer or device according to the phonetic expansion of text or message is called synthezing (DUTOIT, 1997). Speech synthesis can be done by adding audio tracks to each other which is stored in the audio recording database. Phonemes r systems that use audio tracks as phoneme binaries have the opportunity to synthezing all kinds of words in a small amount of record using Lego logic (DUTOIT, 1996). However, these kinds of synthesis systems are very poor for intelligibility and naturalness. In this regard, the unit selection systems that use longer pieces of audio are used more widely today (KOMINEK, 2003)(J.ZHANG, 2004).
Turkish studies are still limited even though very large numbers of systems are developed for western languages. MBROLA (DUTOIT, 1996), FESTIVAL (DUBUISSON, 2009), MULTEXT (VERONIS, 1994), GENGLISH (DUTOIT, 2005), HTS (YAMAGISHI, 2007) have been developed for synthesizing more than one language. From these systems MBROLA is adapted for Turkish and a working system is developed (BOZKURT, B., 2001).

In this study, triple sounds which is the most frequently used in Turkish and an additive synthesis system which is developed by using double voices that were not covered by triple sounds is planned to use (YURTAY, 2010). This system is a simple system that works by taking string data in digital media and adding sound pieces in sound database as Lego and it is developed in Turkish-based.
In the study of TUBITAK, frequently mentioned 3000 triple voices are determined and it is seen that these voices represent Turkish 90%. By adding 383 double voices to the list which do not exist in the triple voices, a database is developed that is formed totally from 3383 number of pieces. (BICIL, 2010).
As is known, today visually impaired people cannot go to libraries to read books and they are deprived from this social activity except books read by very little number of volunteers or Braille books. In this study, solutions are developed with the help of technology to overcome these shortcomings.
In the system design, the visually impaired person who wants to take advantages of the library services after arrival in the library is directed to the designed system by a librarian. It is aimed to ensure the new book requests, book search and reading a found book from a requested page number with voice guidance and keyboard commands done by the visually impaired person.
It can be said that, visually impaired people can easily use libraries with the help of this system. The design of the system is fully applicable and after applying the processes mentioned in Section 2 and 3, it is planned to dedicate the system automatically and with the support of very few people to visually impaired people.

The processes in implementation and application of the system can be examined in two main topics: Preliminary Processes and Application Stage.

2 PRELIMINARY PROCESSES

2.1 Hardware

In the design of the proposed system, a server and a computer with a minimum 2.53 Ghz processor, 4GB DDR2 Ram, 200GB hard disk are needed. Using the existing server to store books in digital media in the Sakarya University library is considered. The number of computers is limited to one as the initial number and then can be increased depending on the ratio of users.
Library staff must be convinced of using the system as an active and reliable way. Furthermore the system can also be used by visually impaired users who did not before. For this reason, the need for a monitor and a mouse appeared.
During the system work, visually impaired user will direct the system with an input device. At this stage, a choice must be done between two important input devices. These devices are a keyboard and a microphone. They have advantages and disadvantages among each other. In this sense, if the keyboard is selected by visually impaired person who knows to use the keyboard, it is seen to be more efficient and reliable. In the case of visually impaired person who selects to use the microphone eliminates the requirements of using the keyboard and even without using their hands he/she can manage the system. But today's speech recognition technology efficiency, most of the library environment is not completely isolated from sound and most of visually impaired person can use the keyboard. Because of all these reasons the keyboard will be preferred in this study. In addition, a scanner is required for digitization of printed documents in the library.

2.2 Software

In addition to serve for visually impaired person, the system must have the software infrastructures that must be compatible with libraries own automation systems. Thus, the proposed system and library hardware will be used more efficiently and they can be used like other computers in the library.
Paid or free software can be selected to use in the speech synthesis module. However in this proposed system, speech synthesis module that we have developed before will be used (YUCEL, 2010).
Most important parts of the system are voice guidance and management parts of the program used by the visually impaired person. At this stage, the developed software will guide the visually impaired person vocally and then management will be provided as a result of commands taken from the keyboard.
A scanner will be used during the digitization of the printed documents and books in the library. While scanning the papers of the relevant document, they are converted to image format and an OCR (Optical Character Recognition) system to translate the photos into text format is needed. There is much commercial software developed to translate printed documents into digital media like Fine Reader, ReadIris, etc.

2.3 Preparation Stage

In this stage, converting specific printed documents which do not exist in digital media into digital media process is done. The resources in the library can be simply separated into two groups:

- Digital Resources
- Non-digital Sources

2.3.1 Digital Resources

Master's and doctoral theses in the library are in this group. Copies of these documents in Acrobat Reader or other formats can be found usually in the digital medium. All of them are accessible for users. So, these sources can be transferred into the used system rapidly.

2.3.2 Non-Digital Resources

In this stage, only the resources referred to as ink printing in the library. Stories, novels, magazines, newspapers can be considered as examples of these resources.
Speech synthesis can be done to the resources by translating them into digital medium with the help of a software support. In this sense, the system can be dedicated to the visually impaired users. The problem of resources that do not exist in the digital media (non-digital resources) is necessity of digitization.
Designed system aims to do this job as static firstly and then dynamically. At first stage, most popular books in the library by selecting the first 500 of them are planned for digitization with the help of hardware and

software support. Transferred sources will be stored in PDF format. However, one or more people are needed to select books and then transfer in the designed system.
In this study, Microsoft MS-Project program is used to define project's activity, distribution of resource-task. Project is analyzed under the heading of scope, analysis/hardware/software requirements determination, design, development, test stage, documentation, application, dissemination and last revisions. Project's scope determination takes 3,5 days, analysis/hardware/software requirements determination takes 12,5 days, design of suitable and functional environment for the library and obtaining permits takes 7,5 days, development part includes supplying the using software and integrating this to the system takes 30 days, testing of the system takes 4 days, training process takes 6 days, preparing the help documentation takes 18 days, application takes 7 days, dissemination process takes 3 days and last revisions take 3 days. As a result, the estimated time opening the system to use was calculated and found 94,5 days approximately. Project management designed by using MS-Project program is shown in Figure 1.
Many people work in the designed project. They are management part for determining the scope, project manager for resource assignments, choice of software/hardware and following the project, analyst for the design of suitable and functional environment for the library and obtaining permits, developments for the software, tester for testing the system, trainer, technical service for the documentation process, and distribution team for the user opinions work. Resource assignments are made using MS-Project program is shown in Figure 2.

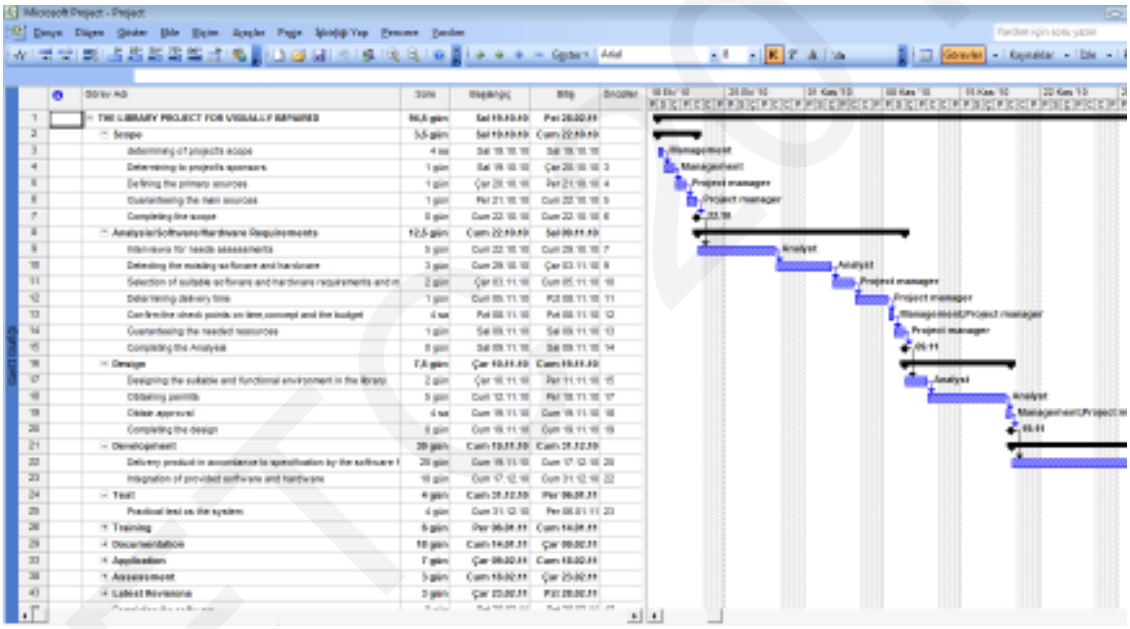

Figure 1: MS-Project Application

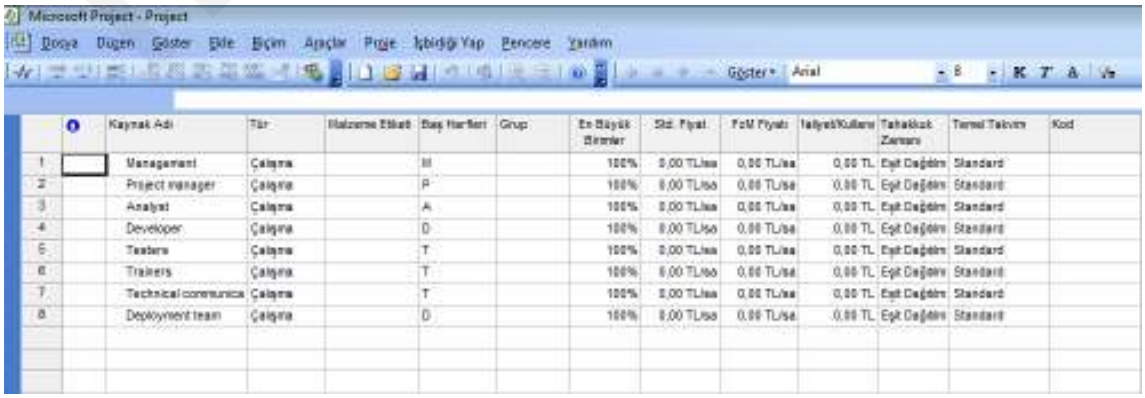

Figure 2: MS-Project resource assignments

3 APPLICATION STAGE

After preparation stage, while the designed system is continuing to serve to visual impaired people; it will continue to evolve according to their wishes. In this stage, system will not need an active care like in preparation stage. Only the new requested ink printing books will continue to transfer to system. In this way, the system will run more efficiently.

4 TEXT NORMALIZATION PROCESS AND THE CHALLENGES OF MATHEMATICAL NOTATIONS

In this study, one of the problem is faced during the synthesizing speech is Turkish non-text format mathematical notation and images. One of the processes to be done is text normalization before synthesizing speech, for example number of 269 as two hundred and sixty nine to read as. Normalization can be used for using of some mathematical notations easily. Such as "% = percent", "°C = Celsius degree", " a^3 = a cube", "$\sqrt{7}$ = square root of seven ".

However, normalization of longer mathematical notation is more difficult. Therefore, creation of clear, understandable and simple standard is necessary. After a standard is created, training and promotion are required for visual impaired. As a result of these, long and complex mathematical notations will be understood in sound format by visual impaired easily.

5 RESULTS

In this study, a simple and working system was designed needed for a visually impaired person to make use of all the library facilities in Sakarya University. A visually impaired person can use the system with the help of sound orientation of the program and the keyboard commands of the user. When the specified requirements are provided, a system can easily be established in the library, so visually impaired people can benefit facilities of the library. Also a standard is created for longer mathematical notations.

6 ACKNOWLEDGEMENT

Thanks to TUBITAK-UEKAE Multimedia Technologies Laboratory.

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MATHEMATICS AND MATHEMATICAL TECHNOLOGY IN EDUCATIONAL TECHNOLOGIES

ABSTRACT

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To open discussion about some terms of mathematics and mathematical tech-nology in educational. Our main focus should be hightlighted to growing important to more practice methods for solving practical problems. Term „solving“ is in wide meaning of it, eg. manipulating by rules, operators, etc.

Educational process must have two inseparable parts. „Explanation“ part, where we are saying „what“ and „training“ part where we are „doing how“. Be focused not only to classical steps as definition, lemma, verification eg. part expla-nation of mathematical education. We suppose not only University or engineering problems, very important is be able to have some practical abilities for solving problems at secondary school too. We are satisfied there are a lot practical, engi-neering, generaly technical, studies where is probably more important to be able to practically solve some kinds of problem before having all theoretical knowledges about it eg. part training.

It would not be simple at all. Mathematic scienses has more than one century of developing of suitable terms, objects, ways of argumentations, logical structu-res, verifications behind its. Mathematical technology hasn’t such develop progress behind it, hasn’t stable terminology, hasn’t stable argumentation, etc. And mathe-matical technology in educational technologies specially.

Introduction

If we try to define content of term „educational technology“, we have a relativelly hard task. It’s possible to define it various ways. We can use one of the possible, not so exact definitions:

> *. . . is continuous process and set of proper tools how to „pull“ usefull informations to „recepients“, students. Everybody can be a stu-dent, o cer, general director, o ce manager, worker, teacher. . .*

It is not best definition probably, there are exits much more precission defini-tion, much more better definition, but now its enough for us. For e ective educati-onal process, is very usefull to use such tools, such „procedures“, such ilustrative examples which a able to break through, to deep into student’s mind. One of the methods, very good method and very old method is using various tools, various similarities, various examples.

Tools could be various types. Classical tools, for example wired model of cubic box with some highlighted details. New, „modern“ tools, visualised the same mo-del of cubic box on monitor of computer, abstract model using a descriptions of equations and others. It’s clear the computerised, visualised, „virtualised“ models have great potential to bring closer core of studying problem to students. Problem how to demostrate 3D problem via 2D computer’s monitor projection is very inte-resting, popular and important now. But our focus isn’t to solve or study this kind of tasks.

Problem definition

We are focused to partially study similar problem, similar task. How to use a mathematics and mathematical technology, ususally hidden inside of all kinds of computer’s visualisaion in educational processes more efectivelly. We would like to try to show hidden dangerous if mathematics and mathematical technologies aren’t „balanced“ too.

As every scietific branch has two main, dialectical parts, what properties has our subject which we are study and how to use these properties in „normal life“ actually. So mathematic science has the same two parts too. Methodology, how to find various important properties about almost everything and methodology, how to caclulate almost everything. It’s very important to know various propreties of various subject of our study of course. But it’s very important to know how to find usefull practical solution of practical problems, too. And in many parts of (mainly) technical studying we prefer ability to find efective, usefull, usually corect solution of technical problems. On opposite side many „sciencies“ more and more prefer a congitive part of studying. Training, or calculating part of sciences is not so intensive practicing during educational process generally.

Example

We can try to show it on some more ore less trivial examples.

Very good opportunity for such explanation are the numerical series. Due to „classical“ aproach, very often used there are two main di erent type of numerical series. Aritmetical series and geometrical series and its variants. Then a teacher ususally continues some variant of example or some variant of analytical desriptions. For example:

$$\{a1, a2, a3, \ldots, aN\} \Rightarrow aN = \frac{1+n}{1-n}$$

or

$$\{b_1, b_2, b_3, \ldots, b_N\} \Rightarrow b_N = \frac{1}{1-p^0}$$

Then all teachers start to investigate various properties of both series. And formula-tes many generalised theoretical results about it. Some teachers say the students to exists other type analytics descriptions of series. For example recursive description:

$$\{c_1, c_2, c_3, \ldots, c_N\} \Rightarrow c_N = a \cdot c_{N-1} + b \cdot c_{N-2}$$

It is typical that coefients a and b in previous example are usually very compli-cated functions compounded from other very complicated coeficients and these compounded coeficients are compouded. . .

The relatively „friendly“ description of equations in previous example looks suddenly very unfriendly.

Good teachers practise some less or more trivial examples to validating genera-lised theoretical results. A lot of students heard that these analytical descriptions has very deep relationalships with diferential gap. But only heard.

A lot of students heard sometime, somewhere the numerical series be able defi-ned by table. And that series has some properties, there are axists some „special“ method to investigate it and so. But again, only heard.

Discussion

In real world, the numerical series are very often done by table. For everyday life are these series usually much more important than others. Yes, there are economic or financial data. In almost all cases is very di cult to „describe“ them some analytics formulas. Various methods how to „investigate“ such data are subject of special economists studies mainly. During these studies the students „suddnely“ find a „dark, deep mystery“ how to manipulate with. Yes, it’s heavy-handed of course. But we can notice it’s typical to try to „find“ some analytical descriptions in such cases too. Usually various linear, logarithmic or exponential aproximation (interpolation or extrapolation) of table data. Where the economic sicientis take a convince of true of such procedures. Again, it’s heavy-handed, but not much.

We are hope this „state“ is time-temporal only. Best defense against it, in our opinion, is more and better training a part of mathematics which more training a practise method for solving an „life’s examples“. We hope that training more complex examples on non-analytical data is very good way to understand its reati-ons in deep. We hope to reconnect theoretical results and practical facility in one integral entity with really deep harmonic relationships is one of e ective solutions.

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MATH ATTITUDES of CEIT' STUDENTS

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ABSTRACT
Computer Education and Instructional Technology (CEIT) Departments train computer teachers to fill gap of computer instructor in all grades of schools in Turkey. Additionally graduates can also work as instructional technologist or software developer. The curriculum of CEIT departments includes mathematics courses. The aim of this study is to identify attitudes of undergraduate students at CEIT departments towards math. In order to investigate the research question quantitative methods was used. Specifically survey research was preferred. Mathematics Attitude Questionnaire (MAQ) that was developed by Duatepe and Çilesiz (1999) was used and the questionnaire includes 38 items. The instrument was conducted with 122 undergraduate students from CEIT departments of four different universities in Turkey in the spring semester of 2010- 2011. Data were analyzed through independent samples t-test and one-way ANOVA by means of PASW Statistics-18. It was found that there are some differences in terms of math attitudes of CEIT's students.
Keywords: CEIT Students, Math Attitudes, Computer Education, Math Courses.

1. INTRODUCTION

As it is known departments of Computer Education and Instructional Technologies (CEIT) were founded in 1998 by reconstructing education faculties in Turkey (Şahinkayası & Şahinkayası, 2004) and there are no departments like CEIT in the world except Turkey. The basic purposes of department of CEIT can be ordered as, for education foundations enhancing the methods and techniques which are essential for functional use of computer and instruction technologies' products, teaching of and expanding these methods and techniques and training individuals who want to be teachers in these foundations.
Today, in Turkey the students who want to get training in the departments of CEIT must have YGS-1 scores. In YGS exam, math composes 40 % of the whole questions. The questions of math in this exam are based on elementary and first grade of high school curricula. Hence, undergraduate students who enrolled in the departments of CEIT may probably have no high levels of math knowledge. However at contents of courses in the departments of CEIT, there are intensive content of mathematics courses.
For instance Math I course includes the topics such as, the concept of functions, the concept of limits, the concept of derivatives, equations of tangent and normal, curve sketching (YÖK, 2011).
In math education, the importance of attitude towards math is emphasized mostly. Attitude towards math has been researched for determining from the point of particular grade of students and different viewpoints (Tocci, 1991; Rounds & Hendel, 1980; Tabuk & Özdemir, 2010). According to Tezer and Karasel, (2010), generally the relationship between attitude towards math and achievement in math is investigated and concluded that attitude towards math influences achievement in math.
A survey study was conducted by Köğce et al. (2009) with the purpose of determining and comparing the second grade elementary students' attitudes towards math. The researchers used the same instrument with this study but they adapted the scale for conducting to elementary students. They reached some statistically significant differences between attitude scores towards math and receiving private tuition at grade 6 and 7, math achievement score and educational background of parents, profession of fathers at grade 6 and 8, profession of mothers at grade 6 and lastly grade level of students in elementary schools. Additionally they did not find significant difference in terms of gender. Another study was applied to secondary school students by Yara, (2009) and it was found that the students have positive attitudes towards math and they think that math is crucial and necessary for their future life.
Ma, (1997) conducted a research which is related with reciprocal relationships between attitude towards math and achievement in math to approximately a thousand high school seniors. The researcher concluded that fathers have more effect in their children's achievement in math while mothers have more effect on their children's attitude towards math. Another result of this study is mothers who have lower education level have more effects on their children's awareness of importance of math so the researcher pointed out this may be a result of that mothers' feelings of deficiencies in terms of education and occupation. And the researcher added culture can affect the attitudes towards math more than the achievement in math in terms of children' parents' education level. Moreover it is found out; gender differences of students do not have an effect on the attitudes. According to Ma (1997); being a successful student at math does not mean that student have less concern about attitude towards math.

Sırmacı (2007) investigated the university students' anxiety and attitudes towards math. The researcher found that female students have more positive attitudes in terms of benefits of the perceived math and parents' attitudes towards math. And she did not find significant difference between attitudes towards math and the students' graduated schools from and the occupation of students' fathers.
According to Duatepe and Çilesiz (1999); it is seen that most of the undergraduate students who are unsuccessful at math for whom it is an obligatory course in the first year of curriculum of universities, have negative ideas about the math course. At the departments of CEIT content of courses requires substantial math content knowledge. However in a research, which was conducted with final-year students and graduates of the departments of CEIT, it was found that science and math courses are viewed as the least useful courses (Acat et al., 2007). At this point, according to a master thesis's result which is about the effect of the mathematical knowledge background of the computer education students to their undergraduate education, it is concluded that students who have more powerful math knowledge have more probability to be successful at CEIT departments (İşlek, 2007).
The main purpose of this study is to determine attitudes of undergraduate students at CEIT departments towards mathematics. The variables that can affect the students' attitudes towards mathematics were investigated in terms of gender, type of graduated high school, grade of high school diploma, YGS-1 score, which they received, their fathers' education level, their mothers' education level, grade of Information Technologies in Education I course and lastly grade of Mathematics I course.

2. METHOD

In the study descriptive model being one of the research methods, is used in order to determine the attitude of CEIT students towards math. Descriptive models are approaches that aim to describe an incident in the way it exists or used to exist. The incident that needs to be known exists and it is out there. The important issue is to observe it in an appropriate way and to detect it (Karasar, 2000). The data of the study were collected by means of "Math Attitude Scale" developed by Duatepe and Çilesiz (1999). The Cronbach's Alpha reliability coefficient of the original scale is 0.96. The reliability coefficient (Cronbach's Alpha) of the scale for this study is found to be 0.96 which is the same value with the original scale. The data were then analyzed and interpreted by means of PASW Statistics 18. In the analysis of data, independent sample t test was used in order to determine whether there is a significant difference among students' attitude towards math as regards their gender and their mothers' education levels. One way ANOVA was used in order to determine whether there is a significant difference among students' attitude towards math as regards their type of graduated high school, grade of high school diploma, YGS-1 score which they received, their fathers' education level, grade of IT in Education I course and lastly grade of Math I course. Reliability level is p=0.05.
The research problem was stated as "What are the attitudes towards math course of the first year undergraduate students at the departments of CEIT? This problem was examined by the sub-problems: Is there a statistically significant difference between total math attitude scores and respectively gender, type of graduated high school, grade of high school diploma, YGS-1 score, mother's education level, father's education level, grade of Information Technologies in Education I course, grade of Math I course?

2.1. Sample

The population of the study is faculty of educations which have CEIT Departments in Turkey. The sample of the study consists of 122 CEIT students, who are taking or have taken Math I course at the CEIT Departments in four universities in Turkey. At this point the purpose was to encounter the students with math in recent time so; it is aimed to provide reflecting consistent and real answers in questionnaire about math attitude. The sample and the universities were randomly selected for the study. The participant students were reached via e-mail and they replied back through e-mails as voluntarily.
Table 1 shows that students' properties which are gender, type of graduated high school, grade of high school diploma, YGS-1 score which they got, their mothers' education level, their fathers' education level, grades of IT in Education I course and grades of Math I course.
As seen by Table 1, 47,5 % of the participants are male students (n= 58) and 52,5 % of the participants are female students (n=64). The majority of participant students who graduated from vocational high school are composed nearly the sample's half. The ratio of them is 48,4 % (n=59).It was also found out that 43,4 % (n=53) of the students' grades of high school diploma is in the interval of 4.51-5,00. Also it can be seen that from Table 1, 43,4 % (n=53) of the students' got from YGS-1 400-419 score. The students' mothers' education levels are mostly elementary education or illiterate. The ratio of them is 72,1 % (n=88). And the students' fathers' education levels are mostly elementary education or illiterate, the ratio of them is 44,3 % (n=54). 40,2 % (n=49) of the students got BB- BA from Information Technology in Education I course. The students' 30,3 % (n=37) got CC- CB from Math I course.

To decide whether conducting parametric or nonparametric tests, Kolmogrov Smirnov test and test of homogeneity of variances in ANOVA were conducted. At the end of these analysis since it is reached the value of p>0,05, it is decided that the data had normal distribution and were homogeneous. Thus parametric tests were conducted to the data.

Table 1. Demographic properties of students that took part in the study

	Property	*f*	*%*		*Property*	*F*	*%*
Gender	Male	58	47,5	Type of Graduated (High school)	General high school	38	31,1
	Female	64	52,5		Vocational high school	59	48,4
					Anatolian high school	25	20,5
Diploma Grade (High School)	4,00 and below	29	23,8	YGS-1 Score	400- 419	53	43,4
	4,01-4,50	40	32,8		420- 439	28	23,0
	4,51-5,00	53	43,4		440-+	41	33,6
Mother' Education Level	Illiterate and Elementary Education	88	72,1	Father' Education Level	Illiterate and Elementary Education	54	44,3
					Secondary Education	37	30,3
	Secondary Education and above	34	27,9		College and above	31	25,4
IT in Education I Grade (Course)	AA	20	16,4	Math I Grade (Course)	BB-BA and above	30	24,6
	BB-BA	49	40,2		CC-CB	37	30,3
	CC-CB	24	19,7		DD-DC	20	16,4
	DD-DC and below	29	23,8		FF-FD	35	28,7

2.2. Data collection

CEIT students' math attitudes were determined by "Math Attitude Scale" developed by Duatepe and Çilesiz (1999); personal information was collected by "Personal Information Survey". In the math attitude scale there are 38 items; of which 22 are negative and 16 are positive; in 4 factors. These factors are "like and interest, anxiety and confidence, occupational and daily importance, enjoyment".

3. RESULTS

Below there is a summary of the findings from the study and some remarks on them. In the study the attitude of students towards math is analyzed statistically according to their gender by an independent sample t test. The results are given in Table 2.

Table 2. Independent sample t test analysis results according to gender*

	Gender	*n*	*∑X*	*SD*	*Levene Test*		*Df*	*t*	*p*
					F	*p*			
Total math attitude score	Female	58	137,88	28,52	3,276	0,073	120	3,465	0,001
	Male	64	118,39	33,13					

It is seen from Table 2 that female students ($\sum X$=137,87) have more positive attitude than male students ($\sum X$ =118,39) towards math. The relation between the total math attitude score of the students and their gender was analyzed and it was seen that there is a significant difference ($t_{(120)}$=3,465; p< 0,05). This result shows that there is a significant difference between the gender and the total math attitude score in favor of female students.

We aimed to analyze the attitude of students towards math as regards the type of graduated high school, and we applied one way ANOVA. The results are given in Table 3.

Table 3. One way ANOVA for the attitude as regards type of graduated high school*

	Graduated High School Type	*n*	*∑X*	*SD*	*Source of variance*	*Sum of Squares*	*Df*	*F*	*p*
Total math attitude score	General High School	38	138,45	26,34	Between groups	19475,08	2	10,77	0,00
	Vocational High School	59	114,66	32,54					
	Anatolian High School	25	141,92	29,22	Within group	107604,46	119		

When Table 3 is analyzed, it is seen that the total attitude scores towards math is the highest ($\sum X$ = 141,92) for the students, who graduated from Anatolian high school. There is a significant difference between type of graduated high school and the total attitude scores towards math ($F_{(2,119)}$= 10,77; p < 0,05). In order to find out among which group this difference results from, we applied Scheffe analysis in ANOVA. It is understood that the total math attitude scores for general high school ($\sum X$= 138,45) is significantly different from vocational high school ($\sum X$ = 114,66) and the total math attitude scores for Anatolian high school ($\sum X$= 141,92) is significantly different from vocational high school ($\sum X$ = 114,66). The students who graduated from Anatolian high school and general high school have more positive attitude towards math separately compared with the students who graduated from vocational high school.

We also aimed to analyze the attitude of students towards math as regards grades of high school diploma. For this analysis we applied one way ANOVA to the data and the results are given in Table 4.

Table 4. One way ANOVA for attitude as regards grades of high school diploma variable*

	High School Diploma Grades	*n*	*∑X*	*SD*	*Source of variance*	*Sum of squares*	*Df*	*F*	*p*
Total Math attitude score	4,00 and below	29	123,58	38,00	Between groups	1810,06	2	0,86	0,426
	4,01-4,50	40	133,03	30,88					
	4,51-5,00	53	125,83	30,27	Within group	125269,48	119		

When Table 4 is analyzed, it can be seen that the total attitude scores towards math is the highest ($\sum X$ = 133,03) for the students whose grades of high school diploma is in the interval of 4,01- 4,50. There is no statistically significant difference between grades of high school diploma and the total attitude scores towards math ($F_{(2,119)}$= 0,86; p > 0,05).

We analyzed the attitude of students towards math as regards YGS-1 score which they got. For this analysis we applied one way ANOVA to the data and the results are given in Table 5.

Table 5. One way ANOVA for the attitude as regards YGS-1 score variable*

	YGS-1 Score	*N*	$\sum X$	*SD*	*Source of variance*	*Sum of Squares*	*Df*	*F*	*p*
Total Math attitude score	400- 419	53	127,00	29,90	Between groups	8068,08	2	4,034	0,020
	420- 439	28	115,11	38,88					
	440 +	41	137,07	28,14	Within group	119011,46	119		

When Table 5 is analyzed, it is seen that the total attitude scores towards math is the highest ($\sum X$ = 137,07) for the students, who got 440 and above from YGS-1. There is a significant difference between grades of YGS-1 score and the total attitude scores towards math ($F_{(2,119)}$= 4,034; p < 0,05). In order to find out among which group this difference results from, we applied Scheffe analysis in ANOVA. It is understood that the total math attitude scores for the students who got 420-439 from YGS-1 ($\sum X$ =115,11) is significantly different from the students who got 440 and above from YGS-1 ($\sum X$ = 137,07). The students who got 440 and above from YGS-1, have more positive attitude towards math than the students who got 420- 439 from YGS-1.

In the study we also aimed to analyze the attitude of students towards math as regards their mothers' education level. For this analysis we applied independent sample t-test to the data and the results are given in Table 6.

Table 6. Independent sample t test analysis results according to mothers' education level variable*

	Mothers' education level	*n*	$\sum X$	*SD*	*Levene Test*		*Df*	*t*	*p*
					F	*p*			
Total math attitude score	Illiterate and Elementary Education	88	129,38	31,64	0,072	0,79	120	0,942	0,348
	Secondary Education and Above	34	123,21	34,40					

When Table 6 is analyzed, it can be seen that the students whose mother' education levels are elementary education or illiterate ($\sum X$ =129,38) have more positive attitude than the students whose mother' education levels are secondary education and above ($\sum X$ =123,21). The relation between the total math attitude score of the students and their mothers' education levels was analyzed and it was seen that there is no significant difference ($t_{(120)}$=0,942; p> 0,05). This result shows that there is no significant relation between the students' mothers' education levels and the total math attitude scores.

In the study we analyzed the attitude of students towards math as regards their fathers' education level. For this analysis we applied one way ANOVA to the data and the results are given in Table 7.

Table 7. One way ANOVA for the attitude as regards their fathers' education level variable*

	Fathers' education level	*n*	$\sum X$	*SD*	*Source of variance*	*Sum of squares*	*Df*	*F*	*p*
Total Math attitude score	Illiterate and Elementary Education	54	121,07	33,43	Between groups	6648,36	2	3,285	0,041
	Secondary Education	37	138,38	32,58					
	College and above	31	126,32	25,42	Within group	120431,18	119		

When Table 7 is analyzed, it can be seen that the total attitude scores towards math is the highest ($\sum X$ = 138,38) for the students whose father' education levels are secondary education. There is a significant difference between the students' fathers' education levels and the total attitude scores towards math ($F_{(2,119)}$= 3,285; p < 0,05). In order to find out among which group this difference results from, we applied Scheffe analysis in ANOVA. It is understood that the total math attitude scores for the students whose fathers' education levels are elementary school or illiterate ($\sum X$ = 121,07) is significantly different from the students whose fathers' education levels are secondary education ($\sum X$ = 138,38). The students whose fathers' education levels are secondary education have more positive attitude towards math than the students whose fathers' education levels are elementary school or illiterate.

In the study we also aimed to analyze the attitude of students towards math as regards students' grades of IT in Education I course. For this analysis we applied one way ANOVA to the data and the results are given in Table 8.

Table 8. One way ANOVA for the attitude as regards grades of IT in Education I course variable*

	IT in Education-I Course Grade	*n*	$\sum X$	*SD*	*Source of variance*	*Sum of Squares*	*Df*	*F*	*p*
Total Math attitude score	AA	20	123,40	36,19	Between groups	1763,09	3	0,553	0,647
	BB-BA	49	126,86	29,42					
	CC-CB	24	125,04	37,68	Within group	125316,45	118		
	DD-DC and below	29	134,10	30,60					

When Table 8 is analyzed, it is seen that the total attitude scores towards math is the highest ($\sum X$ = 134,10) for the students whose grades of IT in Education I course are DD-DC or below. There is no statistically significant difference between the students' grades of IT in Education I course and the total attitude scores towards math ($F_{(3,118)}$= 0,553; p > 0,05).

Lastly in the study we also aimed to analyze the attitude of students towards math as regards students' course grades of Math I. For this analysis we applied one way ANOVA to the data and the results are given in Table 9.

Table 9. One way ANOVA for the attitude as regards grades of Math I variable*

	Math-I Course Grade	*n*	$\sum X$	*SD*	*Source of variance*	*Sum of Squares*	*Df*	*F*	*P*
Total Math attitude score	BB-BA and above	30	142,27	27,73	Between groups	15859,23	3	5,609	0,001
	CC-CB	37	133,22	31,58					
	DD-DC	20	111,00	38,25	Within group	111220,31	118		
	FF-FD	35	118,77	27,24					

When Table 8 is analyzed, it is seen that the total attitude scores towards math is the highest ($\sum X$ = 142,27) for the students whose grades of Math I course are BB-BA or above. There is a statistically significant difference between the students' grades of Math I course and the total attitude scores towards math ($F_{(3,118)}$= 5,609; p < 0,05). In order to find out among which group this difference results from, we applied Scheffe analysis in ANOVA. It is understood that the total math attitude score for the students who got BB-BA ($\sum X$ = 142,27) or above from Math I course is significantly different from the students who got DD-DC ($\sum X$ = 111,00) and FF-FD ($\sum X$ = 118,77) from Math I course. The students who got BB-BA or above from Math I course have more positive attitude towards math than the students the students who got DD-DC and FF-FD from Math I.

4. DISCUSSION and CONCLUSION

This study was conducted by the idea of computer science is a field that requires the ability of analytic thinking and in respect of CEIT departments' extent, it is important to determine students' attitudes towards math. The results that were obtained from can be summarized as below.

It was found that there is a significant difference between the gender and the total math attitude score in favor of female students. Although Ma (1997)'s, Farooq and Shah (2008)'s, Köğce, et al. (2009)'s and Uşun and Gökçen (2010)'s studies reached the result that indicates gender of the students do not affect their attitudes towards math, this study found that female students have more positive attitudes towards math than male students. Yenilmez (2007)'s research result supports this result.

According to type of graduated high school a significant difference is found in terms of total math attitude scores. It is understood that the students who graduated from Anatolian high school and general high school have more positive attitude towards math separately compared with the students who graduated from vocational high school. However Sırmacı (2007)'s study stated that students who have anxiety towards math have negative attitude towards math and the study concluded that there is no significant difference between the type of graduated high school and anxiety towards math.

Another result is that students whose grades of high school diploma are in the interval of 4,01- 4,50 have more positive attitude towards math. There is no statistically significant difference between grades of high school diploma and the total attitude scores towards math.

In the study we concluded that there is a significant difference between grades of YGS-1 score and the total attitude scores towards math. The students who got 440 and above from YGS-1, have more positive attitude towards math than the students who got 420- 439 from YGS-1. When it is considered math questions consist of 40 % of YGS-1 exam, this result is not surprising.

The students whose mothers' education levels are elementary education and illiterate have more positive attitude than the students whose mother' education levels are secondary education and above and there is no significant difference between the students' mothers' education levels and the total math attitude scores. Yenilmez (2007) in his study did not find a significant difference between attitude towards math and mothers' and fathers' education level. However in this study there is a significant difference between the students' fathers' education levels and the total attitude scores towards math. The students whose fathers' education levels are secondary education have more positive attitude towards math than the students whose fathers' education levels are elementary school or illiterate. On the other hand according to Ma (1997)'s study; fathers affect students' math achievement while mothers affect children's attitude towards math.

There is no significant difference between attitude and grades of Information Technologies in Education I course. It is found that the total attitude scores towards math is the highest for the students whose grades of IT in Education I course are DD- DC or below, this seems interesting.

Lastly in the study we analyzed the attitude of students towards math as regards students' course grades of Math I. It can be said that the students whose grades of Math-I course are BB- BA or above have more positive attitude towards math. It is an expected result.

Besides all these results, it is thought that the students who are enrolled the CEIT departments with YGS-I, encounters with Math-2 courses subjects primarily so this situation can cause the students have negative attitudes towards math.

Another important result is that students, who are successful at Information Technology in Education I course, are mostly graduated from vocational high schools and they have less positive attitudes towards math.

Reforming of the CEIT Departments' curricula in terms of math attitudes of the students is essential. Students of the departments should have the ability of analytical thinking and this ability should be existing either prior to the beginning of the studies (at the high school level) or should be given to the departments students by means of academic preparation year at the university. The results of our study are expected to illuminate the discussions in this area.

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MENTAL PROCESSES OF READING INSTRUCTIONAL ILLUSTRATIONS IN NON-LINEAR INTERACTIVE SEQUENTIAL ART

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Abstract:

The interplay of written and visual elements may render sequential art an innovative educational medium, especially when channels or mechanisms of traditional media are weak or hardly cause a positive effect in learning scientific subjects where reading sometimes exists as a passive activity. This paper aims to clarify the role of non-linear interactive sequential art and to highlight the significance of instructional illustrations of special characteristics - with Multi, exploded, ghosted views of complex structures and different perspectives - where reading needs certain mental processes and takes other dimensions through several visual techniques as Motion arrows, Frame sequences and animations. This medium could be a valuable learning resource for motivating learners - who may play a role of creators, rather than merely receivers of information - enabling them to construct knowledge and promoting their intellectual and cognitive skills, but with controlling their interactions and guiding their reading path activity.

INTRODUCTION

The unique pictorial language of sequential art with its different formats - according to length and level of narration complexity from short strips to graphic novels – proved to present information directly or indirectly in an interesting way**.** Its use for educational purposes is a trend expanded worldwide through years, either published in a printed or an electronic digital form. The visual appeal of the graphic representation and the tendency towards intriguing narrative make sequential art an excellent vehicle for conveying scientific concepts especially when the learner interact with the subject content.

Learners have fewer chances to use and develop visual learning abilities as we often tend to stress verbal over visual learning because the written text and the lecture are the primary modes of instruction. Tapping these abilities with instructional illustrations in sequential art reinforce learning in ways that verbal learning alone would not. As illustration has always been an important visual communicative medium,it attract attention, aid retention, enhance understanding. The visual graphical elements in illustrations require interpretation and thought to understand them, The learner as an image viewer become an active participant in the perception process and not simply a passive recipient of meaning and this depends on the reading processes especially that those instructional illustrations are constructed within the non-linear narration discovered by the learner .

So this paper aims to show how nonlinear interactive sequential art can be used to enhance learning, engage and motivate learners, and use technology in a practical and effective way, and explain the significance of instructional illustrations of special characteristics with cutaway, exploded, ghosted views of complex structures within the additional panels in the narration. In addition to clarifying the important and basic mental process of reading those illustrations.

NON-LINEAR INTERACTIVE SEQUENTIAL ART

Form structure is the overall system of relations that the learner perceives in non-linear interactive sequential art as a digital educational medium. The reader accesses to the structure of the formal system (panels containing drawings and texts) through his visual sense, where meanings are constructed gradually by understanding and interpreting this formal system. His unifying or framing act of perception and interpretation activates the narration. If the learner does not perceive the arrangement of the graphical representation; he would not continue his interpretation and reading activity.

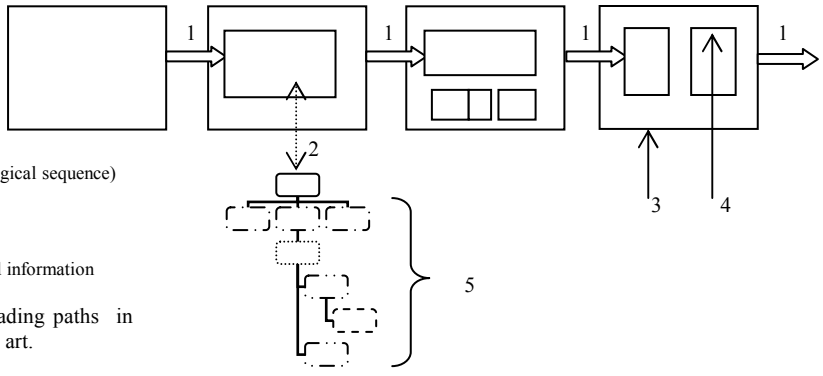
Usually the scientific subject takes a narrative form, includes a beginning starting with the splash page (screen) or panel which develops till the end. The subject is divided into a number of pages containing panels - the building units of the sequence - which are supposed to be read in specific order; Previous steps or events are seen as causes for later ones; what happens first has consequences for what happens later (this implies a chronological structure). **(**Lefèvre, Pascal, 2000**).** In this case sequential art is highly

linear with limited learner interaction, so reading takes a passive activity, even if the subject is repeated more than once and rarely the learner is provided with a new instructional experience, especially in scientific subjects which depend on observing and concluding. (Bangs, Olav and others, 2004)
In contrast, the subject could be read in non-sequential order, with much fewer pages (panels), a non-linear story can represent many different linear detailed content. Or the sole panel may consists of several virtual panels or frames, a single panel seems to contain a representation of a cause and an effect, of several distinct positions of a moving thing or phenomenon. But the learner has always to divide mentally what is given as one and to add mentally frames inside the panel.
Written and visual elements represented in the non sequential panels define a set of simple and deliberate rules which when combined emerge to more complex patterns, and thus motivate the learner to develop more advanced mental strategies for learning the subject. The learner have a space of discovering, suggesting and expecting through reading but without prejudice to the coherent narrative , so each panel has some prerequisites that must be satisfied by the preceding pages (panels).
In a non-linear interactive story the reader can influence the order of panels. Choosing to read the basic information at first then Deepening in the identification of the subject details .Though reading instructional illustrations in non-linear story depends on non fixed narration. The story subject progresses based on the learner's interaction with several degrees (Bangs,Olav and other,2004).A high use of interactivity gives the learner the responsibility for choosing from multiple paths through subject matter, creating an environment where he can easily locate and manage information. Reading here may be active.
In higher level interactivity, an electronic simulation of an environment is presented and prompt the user to respond to simulated conditions with tools analogous to the controlling factors of real conditions in an actual environment. Here are many of the skills acquired as:

- Learning to track or make compensatory movements based on feedback.
- Perception of sensory stimuli that translate into mental performance.
- Learning to have readiness to take a particular action..
- Learning to perform a complex physical or mental skill with confidence and proficiency.
- Learning to modify and create a complex physical or mental skill to accommodate a new situation.

And though Taking experience in some attitudes as:

- Learning and demonstrating the mental preparedness to make decisions by generating the results expected upon completion of prioritized strategies or tactics in response to normal, abnormal, and emergency cues associated with the performance of an operational procedure, and the ability to generate new actions in response to abnormal or emergency cues.
- Learning and demonstrating the mental preparedness to encode operational cues as indicators of normal, abnormal, and emergency conditions associated with the performance of an operational procedure.
- Learning and demonstrating the ability to judge the worth or quality of normal, abnormal, and emergency cues associated with the performance of an operational procedure.
- Learning and demonstrating the mental preparedness to make decisions by using prioritized strategies and tactics in response to normal, abnormal, and emergency condition cues associated with the performance of an operational procedure.



1- Linear reading path (choronological sequence)
2- Non-linear reading path
3- Page(screen) boundaries
4- Main panels
5- Additional panels with detailed information

Fig 1. a diagram explaining reading paths in non-linear interactive sequential art.

INSTRUCTIONAL ILLUSTRATIONS

Instructional illustrations in nonlinear interactive sequential art lie on relations between the whole and its parts, and contribute greatly to clarify the facts, concepts, processes and structures, aiming to generate expressive images that effectively convey certain information. (Mandoor Abd-elsalam, 2007) (Viola ,Ivan and E. Gröller ,Meister, 2005).

Instructional illustrations diverse between literal, pictorial representations, conceptual and diagrammatic solutions .(Alan, Male, 2007) Image form plays the principal role in determining the content understood and recognized by the learner who plays a role in constructing meaning from the image. The use of graphical elements , which are frequently non-pictorial such as motion arrows or lines, are intended to extend and support the meaning of the instructional illustration beyond that which can be shown literally. But these graphical elements may add complexity if the purpose and meaning of the element may not be perfectly clear to the the viewer who may not interpret the illustrator's invention as originally intended , so the illustrator have to identify and distinguish those elements to help and lead the learner reading activity. Some Graphical elements serve as a useful shorthand method for representing phenomena such as thought, speech, direction of movement or past or future action, which are not visually evident when viewing a scene. Arrows can serve a lot of purposes in the instructional illustrations, such as revealing the paths, indicating motions of parts, conveying the direction of flow .In addition can also help learner to understand the specific functional relationships between the parts of the whole, Placing the arrows near contact points between illustrated parts that interact along the causal chain can help viewers better understand the causal relationships, depending on the type, the form of the arrow , the direction of movement , its weight, its tone and its color. (Boling ,Elizabeth and others,2007)

In this part we will explain the nature of instructional illustrations that are contained within the additional non-linear panels that appear when the learner needs to know more detailed information about the subject or it is necessary to see a close up scene and observe parts of the elements inside.The illustration appear when clicking on certain, defined parts of an object. In this case part of the shape can be left away to reveal more interesting inner structures. Due to the viewer's prior experience with the object he still can mentally complete the object from the partial information he is shown and then discover and confirm his guessing through revealing the hidden panels .There are variety expressive visualization methods with several levels of abstraction, the purpose of the illustrations distinguish the choice of the representation method, the most important of these representations are:

Cut-away drawings:
It is displaying a section or part section through the complex subjects or objects. This allows to see through the surface and perceive other surfaces or structures behind. Using arrows along the stream surface enables to see beyond the front stream surfaces and perceive the flow direction. It is important to have a clearly defined idea of what to depict and how to depict it . The illustrator must know where to make the cut and what kind of cut is most appropriate, plus choosing the suitable perspective for the specific requirement, as diametric perspective which is often used for cut-aways. There are some rules should be taken into consideration so the learner could read those illustrations clearly:

- inside and outside objects have to be distinguished from each other.
- a section view is represented by the intersection of two half spaces.
- a mechanism to make the walls visible is needed.
- cut-outs consist of a single hole in the outside object
- interior objects should be visible from any given viewing angle .(j.diepstraten and others, 2003) (Giemsa, Bettina,2007) .(Viola ,Ivan and E. Gröller ,Meister, 2005).

Ghosting representation:
This visual representation uses transparency as the dominant method. so they are semi-transparent illustrative views. The inner parts of an object can be seen by displaying the outer case as if it is transparent. Semi-transparent views unveil interesting objects obscured by context information through increasing the transparency of the context. Various levels of depth can be displayed by using multiple levels of transparency , which may appear gradually on the screen by clicking on the defined parts , care must be taken to preserve clarity , taking into consideration that too much detail , that's too much depth , becomes confusing for the learner. There are some rules to be followed so the learner could read those illustrations clearly.

- Faces of transparent objects never shine through.
- Objects occluded by two transparent objects do not shine through
- transparency falls-off close to the edges of transparent objects.
- Use layers of colors and tones to simulate transparency by placing different layers in light colors over each other.
- Adding light effect and shading to enhance the impression of transparency. (Giemsa, Bettina,2007) .(Viola,Ivan and E. Gröller ,Meister, 2005)

Exploded Views :

Exploded views modify the spatial arrangement of features to uncover the most prominent ones. It is also a very effective way to present assembly instructions. Exploded views enable a clear view on individual features and convey the information about the original spatial location by lines or arrows providing information on assembly order. The many parts have to be drawn in extended positions within the hidden panels where the illustration wouldn't consume more space. However, using this representation view in how things work illustrations can make it difficult for viewers to see which parts interact and how they move in relation to each other. The illustrator needs to place parts skillfully, keeping in mind that the order has a direct influence on the clarity and comprehensivity of the illustration . and the reader shouldn't get lost when looking at the illustration. (Mitra, Niloy J. and others,) The rules for assembly instructions are based on cognitive psychology and experiments:

- assembling is decomposed into a hierarchy of operations and parts in sequential panels.
- parts in the same hierarchy have to be added at the same time-step, or in sequence one after another.
- step-by-step instructions in panel by panel are better understandable than a single diagram showing all the operations.
- diagrams presenting the final assembly are necessary to understand the step-by-step action diagrams.
- parts added in the current assembly step must be clearly visible.
- objects have to be presented in their clearest orientation.
- stylistic devices are varied which enables the learner to percept the meaning of the illustration more easily such as line weights , line types which may form patterns to convey regular and irregular textures through choosing appropriate weighs and spacing for those lines . (Mitra, Niloy J. and others,2010) (Giemsa, Bettina,2007) .(Viola ,Ivan and E. Gröller ,Meister, 2005).

READING INSTRUCTIONAL ILLUSTRATIONS

Reading instructional illustrations is a process of translation, analysis, and interpretation of all the illustrated information, and linking such information to gain access to useful scientific conclusions of the subject content **.** Reading process depends on a range of factors and variables associated with reading graphical representations as it is a complex operation that include many of mental processes of decoding the meaning of the illustrated subject as identifying, describing, differentiation and interpretation**.** Training to read such illustrations need some basic skills as:

- Translation of the illustrations; finding out what each line or symbol or number on the illustration means in each panel and this skill includes knowing the components of the illustration, the sequence of these components, and the relationship between them. The learners are guided to describe the illustration through verbal words or through an introductory explaining page (panel) identifying the concepts of the illustration content .
- Analysis of the illustrations; the ability to recognize the relations between the procedures through clarifying the sequence of the procedures, and requirements of each procedure.
- Interpretation of the illustrations; giving the reason or reasons to the sequence of the illustrations, as well as the relations between the illustrated actions .
- Conclusion of the illustrations ; coming up with some results, generalizations or concepts from the illustration and anticipating certain changes as a result of the implementation of the procedures described.(Fathalla, Mandour Abd-Elsalam,2007).

So Reading instructional illustrations depend on several mental and cognitive processes which are supported by the nature of illustrations including:

Perception:
Some learners(visual thinkers) can actually see the percept shift in their mind's eye in the case of visual perception. (Wettlaufer, Alexandra K.,2003), depending on several features of perception the most important are perceptual constancy, grouping and contrast effect. In addition of effect of motivation and expectation.

Observation:
Instructional illustrations are received and recorded by the learner depending on looking where he thinks he will find positive results, or where it is easy to record or sees what expected to be seen or what wanted to be seen. Observation involves drawing conclusions, as well as building personal views about how to handle similar situations in the future, rather than simply registering something has happened. It is considered a continuous process of learning through visual representations .

Retention:
Retention usually refers to keeping information available in the long-term memory, but the ability to retain needed information in working memory is equally important to learning and performance. The combination of verbal proposition and mental image establishes multiple pathways by which the information can be retrieved from memory; where the learner builds a mental model through constructing three linkages when receiving the instructional illustrated subject:

- construct a verbal representation, in which he builds issues in the working memory.
- construct a visual representation where he builds fantasies in working memory.
- construct linkages that have significance between visual and verbal representations, and this contributes to the mental model building, and so enable the learner to solve problems that require a call to this mental model. (Fathalla, Mandour Abd-Elsalam,2007)

Obviously, illustrations can help learners retain information by stimulating the mental images to facilitate dual-coding. They can be of special value when teaching abstract information by providing images that learners might not generate on their own. Charts showing trends, diagrams of processes, and visual metaphors of abstract ideas are all ways of providing images for abstract ideas.

Attention:
Gaining attention is critical because of the limited capacity and duration of the short-term or working memory which has a capacity of five to nine items and a duration of 10 seconds, according to most researchers.

- attentional focalization : focusing attention on a certain element in the panel (page).
- attentional discarding : stopping attention on an object by transforming focus on another.
- attentional movement : passing attention from one part to another of the attentional field inside each panel.

Illustrations can help because they can be complex to the senses, and because they can provide novelty in the probably more plentiful stream of spoken words or written text. Attention is drawn to what is new or unexpected in the learner sensory field.

Understanding:
Understanding concrete information through abstract illustrations - which depend on line drawings or other simplifications, highlighting the critical elements in an unrealistic way- is usually more effective than realistic illustrations, specially for showing those things that can't normally be seen, such as the interiors of objects and the microscopic and macroscopic. Illustrations are important for teaching principles that have spatial determinants. Realism may be necessary for the later stages of developing expertise, where objectives require learners to identify or manipulate objects in the real world.
Illustrations which convey and explain abstract information by providing spatial metaphors for logical structure using space, lines, boxes, arrows, color, and the relative distance between elements can provide a concrete equivalent of abstract ideas. As there are methods of making graphic representations of the common structures of information, such as comparison and contrast, procedural steps, description, causation, and chronology, For example, column charts are efficient for comparing or contrasting the characteristics of items; time lines are good at showing chronological relationships; flow charts can show causation clearly.

And generally the learner require multiple mental processes which affect realization and reading of instructional illustrations in sequential art, through which he can identify the visual elements, and their relationship, and distinguish details through observation , accurate understanding of the relationships, imagination and critical thinking, then tasting artistic structural relations to evaluate the illustration in each panel and its relationship to the subject as a whole.

CONCLUSION

There are several points must be taken into consideration when implementing instructional illustrations in non-linear interactive sequential art as:

- expressing the nature of the information accurately and clearly .
- clarity of illustration and its suitability for learners plus reflecting the visual pleasure by the side of learning.
- Reducing complexity of the illustration to the minimum level necessary for the objectives by eliminating unnecessary elements.
- Critical elements are made conspicuous, non-critical elements are de-emphasized.
- The illustration is organized to reflect the conceptual or real-world organization of the information.
- Interaction with the illustration is encouraged through the use of captions or questions and references in the panels.
- The need for clarity of navigation tools represented in the hyperlinks to use the aspects of non-linear interactive sequential art easily in the learning process.
- Arranging panels to prevent random eye movement through the subject, taking into consideration the characteristics of this movement represented in the direction of eye movement
- The necessity of identifying the moving track between the panels and the illustrations of the subject, through numbering or naming the panels at the beginning of story, or in every page, which raises the curiosity of the learner to discover the separate images. Beside determining the moving to or from the different images, by clicking on special forms or selecting specific elements without tracking the sequence of the story to be re-viewed and followed in an attempt to understand and explore the subject.

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MISCONCEPTION, COGNITIVE CONFLICT, AND CONCEPTUAL CHANGE: A CASE STUDY WITH PRE-SERVICE TEACHERS

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KAVRAM YANILGISI, BİLİŞSEL ÇATIŞMA VE KAVRAMSAL DEĞİŞİM: ÖĞRETMEN ADAYLARI ILE BIR DURUM ÇALIŞMASI

Bu araştırma; bir Türk Üniversitesi'nde ilköğretim matematik öğretmenliği programında öğrenim görmekte olan yedi öğrenci ilegerçekleştirilen bir nitel çalışmadır. Bu öğrenci grubundan; bütün kenar uzunlukları eşit ve $\sqrt{5}$ birim olan bir altıgeni bir dinamik matematik yazılımı olan GeoGebra ortamında oluşturmaları ve olusturma sürecini bir ekran kaydetme program olan Wink ile kaydetmeleri istenmiştir. Yedi kişilik öğrenci grubu 15 video kaydı oluşturmuştur. Kayıtlar, öğrenciler tarafından bir Wiki ortamına aktarılmıştır. Ekran kaydı görüntüleri kare izleme yöntemi ile analiz edilmiştir. Çalışmada; kavram yanılgısı, bilişsel çatışma ve bunun sonucu olarak bilişsel değişim, verilen bu problem durumu çerçevesinde öğrenci cevapları ışığında tartışılmıştır.

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INTRODUCTION

Conceptual change is different than knowledge acquisition because the former occurs if there exists a prior knowledge and the person who has misconceived this certain type of knowledge is aware of his or her misconception and is willing to evolve his or her understanding towards a correct conceptualization. However, knowledge acquisition needs a lack of prior knowledge – missing knowledge –and/or an existence of incomplete knowledge –gap in knowledge (Chi, 2008). Regardless of the type of conceptual change – whether within or across ontological categories (Chi, 1992), it is quite safe to claim that the first condition to remove misconception is to make the person realize the ill-structure that she or he has. However, realization is necessary but not satisfactory, because the person, then, needs to be convinced to replace the current misconception with the correct one. Put in another way, "[t]he major goal is to create a cognitive conflict to make the learner dissatisfied with his or her existing conception" (Ozdemir& Clark, 2007, p. 352).

In order to achieve this goal in our study, we, first, identified the existence of misconception in preservice teachers' understanding of equilateral hexagons. Equilateral hexagons, in contrast to proper hexagons, may or may not have equal angles. Despite the existence of distinct terms, both in Turkish and English and possibly in other languages too, used to define this distinction; we documented that the distinction is unclear for many people. This paper reports on how we documented preservice teachers' existent misconception on equilateral hexagons and how we used this documentation as an opportunity to engage them in changing –evolving –their conception. Besides reporting conceptual change as a complete process starting from misconception to arriving at the replacement of correct information with the one in conflict, we also documented participants' use of GeoGebra, which provides us with significant information on how they had instrumentalized (Artigue, 2002) this software as a cognitive tool. Regarding the use of technology, this is also an empirically tractable question for us because we also concern about the proper integration of technology itself in mathematics education, theoretically speaking in Technological Pedagogical Content Knowledge – so called TPACK – (Koehler, & Mishra, 2008) of preservice teachers.

Moreover, the research itself is a demonstration of the effective use of Information and Communication Technologies (ICT) in mathematics education research. First, the partners of research team reside in different cities and even in different countries and had to communicate online throughout the research. Second, the exchange of data and information was done through the use of web 2.0 tools, particularly wiki spaces. Third, data collection was done by employing screen capturing, which is a

relativelynew method to collect data (Asselin, &Moayeri, 2010; Cengel&Karadag, 2010; Hosein, Aczel, Clow, & Richardson, 2007; Karadag, 2009). Four, data has been analyzing by using another new method, frame analysis method that is developed by Karadag (2009) during his PhD research and further tested ina study conducted by Cengel and Karadag (2010).

The focus of this paper will be on our initial findings inferred from the screen capturing data illustrating participants' ways of using GeoGebra. We will also present the misconception of a participant by providing explanations and screenshots of her work, as a case,the process of conceptual change that a participant went through. Finally, we will discuss pedagogical implementation of this experiment.

Theoretical Framework

Chi (1992) discriminates the conceptual change within a category and the one across categories and argues that the change in the latter is almost a knowledge acquisition process because the ontological description of concept changes in this case. For example, considering geometric figures such as polygons and circles as functions or relations –that is, analytic form –demandscompletely different type of thinking than what is done in geometry courses and leads to acquisition of a new set of knowledge. Given that conceptual change across categories is beyond the scope of the research being reported here, we will devote our attention to conceptual change within categories.

Figure 1 depicts a tree diagram to represent subcategories of polygon concept within its own category and to delineate the misconception that students may have. As seen in the figure, hexagons can be categorized whether their sides are equal or not. Furthermore, equilateral hexagons can be distinguished with respect to the regularity property. Regular hexagons form a branch of the tree of equilateral hexagons because they have some special constraints. That is, their interior –also exterior –angles at each corner have to be equal whereas this constrain is not a necessary condition for equilateral hexagons. This is the point that many people may have developed a misconception, as a concept in conflict with the correct one but constructed in one's mind as if it is the correct concept (Yenilmez,&Yasa, 2008).

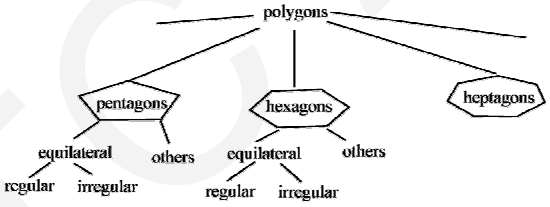

Figure 1: Subcategories of polygon

A similar misconception about regular pentagons has been identified by Ubuz (1999). She stated that students tend to apply the features of regular pentagons to any type of pentagon. It appears that students use the terms of *regular* and *equilateral* interchangeably without paying attention and/or knowing the difference between them. Prior to describing our strategy to remedial this ill structure, it seems to be a good idea to review the framework describing conceptual change for similar cases. Chi (1992) asserts three types of conceptual change within a category, which serves for our purpose as well, to alter misconceptions.

Revision of part-whole relationships

Trapezoids can be defined as quadrilaterals having two opposite sides parallel to each other while parallelograms can be considered as quadrilaterals having also the other opposite sides parallel in addition to the property trapezoids have. Thus, one can interpret the relationships between these two concepts as one of the cases illustrated in Figure 2.

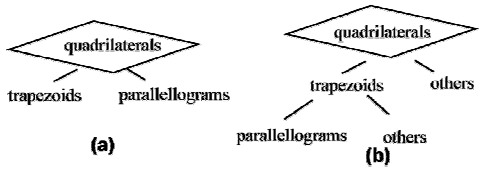

Figure 2.Reorganization of the concept of Quadrilaterals

Moving from (a) to (b) demands a reorganization of the concepts, because no new knowledge is acquired. Also, the change could be achieved through a careful discussion of features.

Formation of new categories

Referring to the example we used in our research, regular hexagons have equal angles whereas equilateral hexagons may have unequal angles too (see Figure 3). The change occurs here is actually the result of a cognitive process because participants are assumed to differentiate one group of figures –regular hexagons – from others –irregular hexagons –to form a new branch under the same tree –equilateral hexagons.

Therefore, the conceptual change in this particular case could be considered as an acquisition process rather than a straightforward migration of subcategories. Aforementioned cognitive processes are the kind of differentiation and integration as well as generalization of subcategories because the person should put a cognitive effort to differentiate the current concepts and integrate in a different way to establish the new cognitive schema.

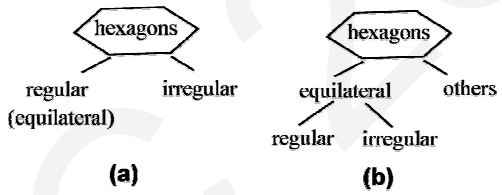

Figure 3.Reorganization of the concept of Hexagons

Reclassification of existing categories

Considering a reclassification of figure 1 as illustrated in the figure 4 requires the formation of new categorical structure. This type of transformation –change –from one existing categorical structure to another one can be achieved without a migration of concepts and even without a really substantial cognitive effort to re-structure his or her understanding but re-classify the current understanding

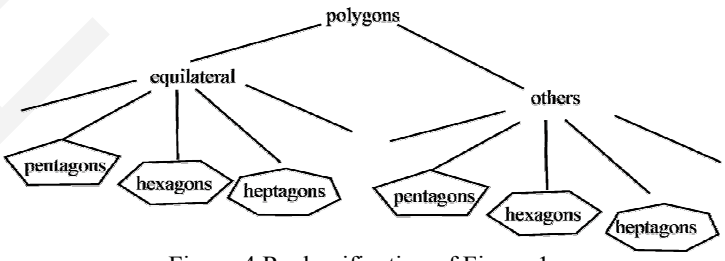

Figure 4.Reclassification of Figure 1

METHODOLOGY

In this qualitative research, 7 pre-service teachers studying mathematics education at a Turkish University were recruited for the study and asked to construct an equilateral hexagon whose sides are $\sqrt{5}$ units in length.

Although it was explicitly emphasized them to create equilateral hexagons, our assumption was that they, at least some of them, would create regular hexagons instead.

They used GeoGebra, which is a dynamic and interactive mathematics learning environment (DIMLE) –a term coined by Martinovic and Karadag (2011)-, to construct their artefacts and Wink to record their work. They were asked to talk aloud while constructing their artefacts such that Wink could record their talking. After completing their work, they submitted their work at a public wiki space because the communications between researchers as well as between participants and researchers have been performed online.

Their work has beenanalyzing by using frame analysis method (FAM), a method developed by Karadag (2009) in his PhD study and re-tested in a study done by Cengel and Karadag (2010). Selected students were interviewed to validate our interpretation of the results and to elaborate on the results of analyses. During the interviews, students were presented their own construction(s) as well as the constructs of equilateral but regular hexagons, developed by researchers.

FINDINGS

The number of constructs submitted to the wiki space by 7 preservice teachers was 15 in total, and some participants submitted more than one construct. The main reason to submit more than one solution is that because those participants intended to illustrate different constructions. The difference in constructions was rooted in various ways. For example, one of the participants used three different techniques such as (1) 1-2-$\sqrt{5}$ right angle triangle, (2) latex command, and (3) analytic formula of circle to make GeoGebra calculate and create a line segment whose length is $\sqrt{5}$. Similarly, they used various techniques to construct the hexagon, such as constructing (1) by using circles, (2) by reflecting triangles, or (3) by marking end points of line segments and connecting them.

In order to investigate how much participants have instrumentalized GeoGebra, screen capturing as a data collection method seems to be an effective strategy because we could have a chance to analyze every and each second of their construction processes. This analysis has revealed that seven participants have developed in varying degrees of competencies of instrumentalization. The detail of the followingdescription of their construction processes is provided in Appendix.

Majority of participants preferred keeping grid view and axes active although some of them used gridlines in their constructions. Their way of using gridlines was usually to construct a line segment, whose length is $\sqrt{5}$, by using two adjacent grid squares, that is a rectangle whose sides are 1 and 2 and therefore whose hypotenuseis $\sqrt{5}$.

Regarding drawing a line segment whose lengthis $\sqrt{5}$, two students used sqrt command while one of them preferred using latex command in their constructions. Also, four of seven students, six out of fifteen constructions,used GeoGebra *regularpolygon tool*to construct hexagon. Therefore, their preferences provide enough evidence for us to assume that their intention was to construct regular hexagons.

Other participants who were not that explicit in using GeoGebra *regularpolygon tool*demonstrated their impressive knowledge of the features of regular hexagons while creating their artefacts. For example, their way of using triangles equilateral triangles, circles, and angles helped us be convinced about their content knowledge and the misconception about the distinction between regular and equilateral hexagons.

More specifically, figure 5 illustrates one construction using 1-2-$\sqrt{5}$ right angle triangle to draw the line segment with a length of $\sqrt{5}$ and using GeoGebra angle command to draw interior angles whose measures are 120 degree each. This construction explicitly illustrates student misconception while drawing an equilateral hexagon because her intention, as seen in her construction, is to create a regular hexagon, whose interior angles are 120 degree. We, researchers, interpret this intention as an evidence of her misconception. Furthermore, one of the researchers, who collected data and is the first author of this paper, explicitly asked her intention in the interview to confirm and validate our interpretation. Given that as any other qualitative research frame analysis method relies on researchers' interpretation to draw conclusion from data, it is researchers' role to validate his or her interpretation.

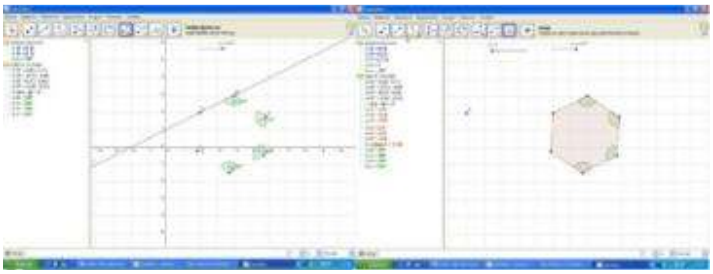

Figure 5. Student construction with GeoGebra

Similarly, figure 6 illustrates another example constructed by the same participant. In this construction, the participant creates an equilateral triangle and reflects the triangle over one of its sides to have the second identical triangle created. Again, our analysis of complete construction process illustrated another construction of regular hexagon. In fact, constructing an equilateral triangle as a starting point seems a strong evidence for the existence of misconception because only regular hexagons have equilateral triangles as part of their internal structures.

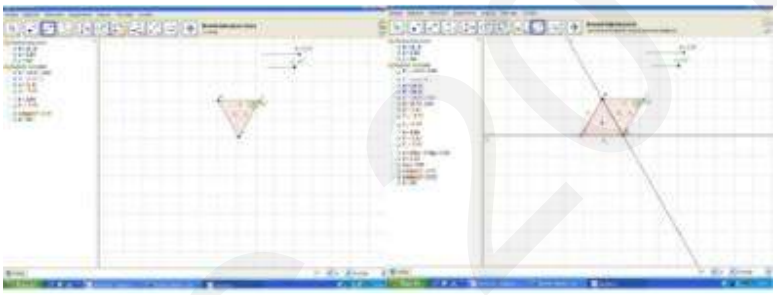

Figure 6.Student construction with GeoGebra-II

In sum, 15 constructions from 7 students explicitly demonstrated that participants had a misconception in distinguishing equilateral and regular hexagons. Then, we interviewed students to confront with their misconception and to experience a cognitive conflict. Transcription of interview data clearly illustrates how they confronted with the conflict and how they replaced their misconception with the correct one.

The first author interviewed participants and videotaped the interviews, and then shared with other authors to analyze their conceptual change process. Since this process is still in progress, we can only share initial findings here. For further data and results, the correspondence author can be contacted. During the interview, their artefacts were presented to participants to confirm our understanding and to triangulate our interpretations, and then some counter examples created by researchers were presented. Their reactions were made explicit by the interruptions of the first author. Their videotaped reactions clearly indicate that their explicit misconception evolve in time and replace with a proper conception. A more important and excitingreality we have learned from this study is discussed in the following section.

DISCUSSION

The data reveals that all participants had the same misconception although we had assumed that most of the participants will have misconception about the aforementioned example. Documenting this reality and bringing this issue front could be considered an academic success. However, the most important and valuable lesson we have learned from this study is not only the existence of misconception nor the method we employed to remedy it. The most inspiring documentation is how participants reflect on their previous

conceptualization periods and how they have started seeking and suggesting strategies to prevent this type of misconception.

To sum, this study shows that this particular type of cognitive conflict –and also cognitive change as an outcome – is quite robust not because of mathematics per se, but rather because of pedagogical consequences of experiment. Further evidence we have gathered through interviewing processes clearly asserts that this type of experience helps preservice teachers to evolve their understanding of mathematical content and, more important than that, to reflect on the reasons had led them to the misconception they had developed in the past. Moreover, this experience encourages them to seek possible strategies to avoid unwanted misconception formation.

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Appendix A

Initial Analysis of Data

Summary

Where: a Turkish University
When: November 2010
How many students: 7 students and 15 constructions

Student name (Gender)	Construction number	Grid view	Axes	Calculating $\sqrt{5}$	Construction method	Using GeoGebra "regular polygon" tool	Sound recording	Stating "regular …"	Using theoretical knowledge leading to "regular..."
BA (F)	1	yes	yes	construction	End points	no	no	no	yes
	2	yes	yes	Latex command	Reflected triangles	no	no	no	yes
	3	yes	yes	Circle radius	Three-circle construction	no	No	no	yes
	4	yes	yes	Circle radius	Six circle	no	no	no	yes
EE (M)	1	no	yes	construction	Reflected triangles	no	no	no	yes
ErE(M)	1	yes	yes	construction	GeoGebra tool	yes	no	no	yes
	2	yes	yes	construction	GeoGebra tool	yes	no	no	yes
FK (F)	1	yes	no	construction	GeoGebra tool	yes	yes	yes	yes
	2	no	yes	construction	Equilateral triangles	no	yes	no	yes
GK (F)	1	yes	yes	construction	Equilateral triangles	no	no	no	yes
	2	yes	yes	construction	GeoGebra tool	yes	no	no	yes
	3	yes	yes	construction	GeoGebra tool	no	no	no	yes
HP (M)	1	no	yes	Sqrt command	End points	no	yes	yes	yes
SS (F)	1	no	yes	Sqrt command	GeoGebra tool	yes	yes	yes	yes
	2	yes	yes	Sqrt command	End points	no	yes	yes	yes

mLEARNING: A Reconceptualisation

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ABSTRACT

The increasing widespread of mLearning application in educational institutions, museums business organisations and other contexts justifies the need for a concept in defining the education practice across these contexts, and also because of the clear concept in defining research agenda and producing predictions and generalizations. The present arguments on concepts of mlearning in the literature do not necessarily define mlearning's unique characteristics. These characteristics are important to be appropriately defined and presented for better understanding of mlearning as future concept of sustainable learning for all. Learning theories, design, activities, and practices for mlearning would then be appropriately described once the concept of the learning is appropriately constructed. Hence the study discussed the important elements and characteristics of mlearning concept which essentially differs it from other technology based learning. The study also proposed an adapted model of mlearning for clearer mapping of the concept.

Keywords : mlearning, elearning, future learning, sustainable learning, digital site-specific learning, learner generated context

INTRODUCTION

During the 4th World Conference on mLearning, Keegan (2005) offers three bases for mLearning to justify its incorporation in mainstream education and training : 1) The

future is wireless where he states that M-commerce has began to gain preference over e-commerce since 1999 resulting in the change in how people do business, stock exchanges and banking through wireless application. This change not only is irreversible but advancing rapidly with the establishment of 3G wireless network since 2001 and the current 4G wireless network which commercially been introduce globally since 2009 and in Malaysia by YTL Corporation in 19 November 2010 (Nystedt. M, 2010). These advancement in wireless network enables individuals to communicate both through voice and video interface, acquire, transmit, and exchange information-rich content among other individuals in the forms of text, voice, graphics, videos, or integration of all these forms, effortless anywhere and anytime; thus gaining new knowledge and these strengthen the case for mLearning (Keegan, 2005); 2) Irritation with the published scenarios for mobile devices of Ericsson and Nokia. In this point of view, he raises his concern that ever since the development of wireless application and mobile technologies by such giant telecommunication operators, applications for education, training or for learning were actually never in the operators' agenda. This actually adds to the reason to the study of mLearning especially in resolving pertaining issues of wireless application and mobile technologies in education especially in the interest of incorporating mLearning in the mainstream education; 3) A 'law' of distance education research.

This last base actually fits best in justifying the need to provide mLearning as the 'law' of distance education research states that 'It is not technologies with inherent pedagogical qualities that are successful in distance education, but technologies that are generally available to citizens' (Keegan, 2005, pp.3). The example given is the 12" laser disc which was introduced in 1990 where later it was discovered to be very useful as a instructional media for English Language course. However the idea was abandoned as it was costly to be afforded by most of the people at the time. E-learning, though was introduced since 1999 fails to be embraced widely especially in third world countries such as Africa as it was too costly to provide necessary infrastructures and facilities to support the technologies. For instance, rural areas like Macha, Zambia in Africa would have to fork out a whopping $1100 per month for a bandwidth connection of only 128 kpbs shared among all Internet users within the village to support e-learning (Pais, 2007).

However for mLearning, the situation is the other way round; the technology for this sector is widely available to almost everyone in the world in the form of mobile communication devices (Keegan, 2005). Never before in the history of technology in education there has been as widely available as the mobile phones. At present, there are about 5 billion mobile phone connections worldwide which covers 72.6% of the world's population with China at the top list (Wikipedia, 2010). In Malaysia, mobile phone penetration reaches a staggering 30,379,000 subscribers, more than the country's population of 28,250,000 (Ng, Voges & Goi, 2010). This interprets that some of the subscribers own more than one mobile phone. Due to this wide availability of mobile technology it is projected that in future, mLearning will generate more carriers and professions worldwide. This partly is due to mLearning's special nature, (mobile, light, not costly and easily access compare to desktop, applicable to various fields, robust such as WiFi technology, many collaborative and individual efforts worldwide engage in

researches and applications using mLearning), which certainly requires a great number of software designers and system developers. Apart from world giant hardware and software corporations like Macintosh, Microsoft, Intel and Ericsson, both professions (software designers and system developers) particularly, are also required by all levels of educational and non-educational institutions for designing their own System for Curriculum Content Designs.

However, one of the main issue is how should mLearning be conceptualized and defined? Researchers are still debating on whether the focus should be on the mobility of learners, learning content or the technology. In different contexts, the focus may shift from learning activities to the portability of mobile technologies or in the way the mobile devices being used. This problematic issue owes to the nature of mLearning of being personal, contextual, and situated; in other words, a 'noisy' phenomenon (Traxler,2007). This would lead mLearning defined in relation to informal learning which would be a problem in incorporating this type of learning in formal learning. This paper attempts to address this issue and propose how mLearning may be conceptualized.

MLEARNING CONCEPT FORM

In his study of mLearning in Africa, Brown (2005) suggests a model for mLearning (shown in Fig. 1) which offers discussion in the concept of mLearning. Based on the model, the researcher agrees that mLearning could qualify to be a subset of distance learning in the context of learning beyond the realm of formal traditional classroom learning. In terms of technology accessibility, distance learning could be divided into two main types: a) non-electronic distance learning (mail correspondence through postal service) or paper-based distance learning as termed by Brown (2005); and b) electronic distance learning aided by technology devices (computers, pc tablets, electronic kiosks, palmtop, PDA, mobile phones, smartphones, MP3/MP4 player, and game stations) and supported by electronic facilities/applications such as the internet, Bluetooth, GPRS etc.

Thus mobile learning could naturally be divided into two types in terms of technology accessibility: a) mobile learning type 1: the first type dominantly focuses more on the learners of the olden days who traveled from one place to another, learning and attaining new knowledge with or without a predetermined intention to seek knowledge. This type is a non-formal learner-centred learning which involves the mobility of learners in engaging themselves to learning through people they meet along their journey and also through interacting with the environment as they move. One's knowledge is passed on and exchanged with others when he/she meets with other people and this promotes development of knowledge of oneself and to the knowledge itself.

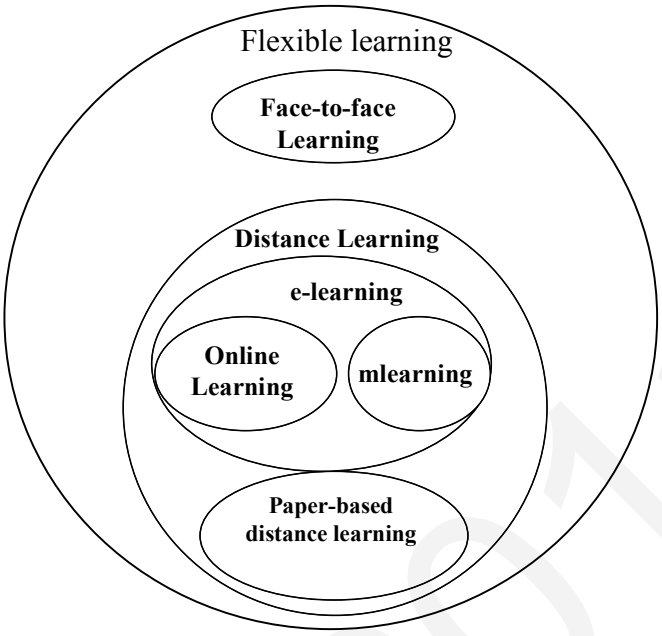


Fig.1. M-learning model
Source:
T. H. Brown (2005). Towards a model for m-learning ini Africa. International Journal on E-Learning, 4(3), 299-315.

According to Tokoro (2003), knowledge is only formed when the sender and the receiver of information share a common context of situation which he termed as "common ground". He elaborated that knowledge will be formed in oneself when the information received is "grounded" in the common ground. For example when the sender gives information about a certain place to a receiver, the information will stay as information to the receiver. But when the receiver goes to the place mentioned by the sender, meaning will be given to the information and the receiver will gain 'grounded knowledge' and no longer having mere information (Tokoro, 2003). In other words, in this context, mobile learning is explorative, situative, contextual, and cooperative in nature; 2) Mobile Learning type 2: the second type of mobile learning involves learning aided by mobile electronic technology especially mobile communication devices brought about by broadband technologies in aiding learners who are separated from time and distance to learn. It is important to note that the learners of this type still interact with people and their immediate environment to learn (similar to mLearning type 1) but making use of the advantages of computational power of the mobile devices (Goth, Frohberg & Schwabe, 2006). The main distinctive feature of mLearning type 2 as compared to mLearning type 1 is the learners, both the sender and the receiver, do not have to share a common physical ground in gaining knowledge. With mobile technology advancements developed by broadband technologies, the learners could share a virtual situation/space that closely resembles reality; thus the transformation of information to knowledge will be much easier (Nonaka.I & Tekeuchi,

1996 cited in Tokoro, 2003). Hence, the learners no longer have to commit themselves to time and place to gain knowledge.

Based on the discussion above, mobile learning type 2 could also be referred to as electronic mobile learning or e-mLearning to differentiate itself to mLearning type 1. However, e-mLearning should not be confused with mobile e-learning (also commonly addressed or abbreviated in the literature as mobile learning or mLearning). Mobile e-learning is e-learning through the use of mobile computational devices (Quinn, 2000; Trifonova & Ronchetti, 2003), which is also an e-learning perspective of defining mLearning. This will be elaborated further in this chapter. E-mLearning on the other hand is mLearning aided by mobile computational devices. In this paper, the term mLearning refers to mobile learning type two or electronic mobile learning (e-mLearning).

PERSPECTIVE AND DEFINITION OF MLEARNING

Defining mLearning not only establishes a shared understanding but would also help to conceptualise mLearning which is essential in observation of its evolution and direction (Traxler, 2009). However, similar to mLearning concept issue, the mLearning community of practice has yet to come to a single agreement on the definition of mLearning though mLearning has emerge since the first published studies in the year 2000 (Sharples, 2000). This is especially due to the dynamic nature of mLearning as new concept of learning. In mobile learning literature, there are basically four main perspectives of mLearning (Winters, 2006, Kukulska-Hulme & Traxler, 2007):

1) Technocentric,
2) Relationship to e-learning,
3) Augmented formal learning, and
4) Learner centred.

Technocentric Perspective

The earliest perspective which also dominates the literature is technocentric which is also based dominantly on mobile technology devices. Here mLearning is perceived as learning using the aid of mobile devices such as PDA, mobile phone, iPod, portable Playstation etc. Examples of definitions of technocentric perspective of mLearning would be learning through mobile devices such as Palms, PDA and mobile phones (Quinn, 2002); any educational provision where the sole or dominant technologies are handheld or palmtop devices" (Traxler, 2005); mLearning as learning away from one's normal learning environment or learning involving the use of mobile devices (Sharples, 2004 in Rajasingham, 2010); mLearning as any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse (Clark & Quinn, 2009) or even by the £6million MoLeNET(2007) UK project which chooses to define mLearning as exploitation of ubiquitous handheld hardware, wireless networking and mobile telephony to enhance and

extend the reach of teaching and learning". The researcher viewed that technocentric definitions began to overwhelm the literature due to the following three main circumstances: 1) mLearning only began to surface a decade ago at worldwide level to serve the growing mobile community as effect of the development of mobile technology especially mobile communication devices such as hand phones, smart phones, and PDAs etc. Although roots of mLearning could be detected as far as thirty eight years ago when Alan Kay (1972) invented the Dynabook, the coinage of mobile and learning to form mobile learning or mLearning was only introduced recently during the flooding of mobile devices throughout the world which resulted also in conferences, seminars and workshops on mLearning within the past 10 years. 2) technocentric definition of mLearning was also resulted from localized and short-term mLearning pilots, trials and researches where most of them were based on usage of mobile devices in learning either looking into the feasibility of mobile devices in aiding learning or effects of mobile devices on learners in acquiring skills and knowledge (Mann.S., 2009; Utulu, Alonge & Emmanuel, 2010). 3) In addition, some of the mLearning projects at the time were funded by mobile communication companies like Ericsson, Motorola and Nokia. Consequently, the project and outcomes of findings usually were geared towards seeking possible market advantages for mobile communication devices and facilities in education line. Thus the tendency and inclination of mLearning projects and research were based on the use of mobile devices in learning. These also led to the techno centric definition of mLearning.

E-Learning Perspective

Another perspective views mLearning as extension to e-learning or a subset of e-learning where e-learning is the macro concept which involves online learning environment and mLearning (Brown, 2005). Here mLearning implicitly means mobile e-learning. Instances of definition through this perspective are mLearning as e-learning through mobile computational devices (Quinn, 2000; Trifonova & Ronchetti, 2003), mLearning is eLearning Lite (Clark & Quinn, 2009) or mLearning as a subset of e-learning (L. Rajasingham, 2010). E-learning perspective is closely related to the former technocentric perspective, to the extend it seems to be a specific subset of technocentric definition of mLearning. However technocentric/e-learning definitions of mLearning were criticized as imprecise justified by the transcience and diversity of the mobile devices, systems and platforms which resulted in highly unstable definition (Traxler, 2009). MLearning is conveniently placed somewhere on e-learning's spectrum of portability (Traxler, 2005); thus does not lend in characterising the unique nature of mLearning (Winters, 2007). An e-learning definition would assume mLearning as a lesser degree mode of learning comparatively. In e-learning definition of mLearning, the small mobile computational devices are thought to assume similar active role in replace of desktop or laptop computers. This inevitably raises some technical drawbacks of mLearning due to the small screen size of mobile devices and short battery life span compared to desktops or laptops, and conveniently limiting mLearning in its prospect for future learning. MLearning would be perceived as merely a branch of a primary mode of e-learning. In e-learning, computers wired by the internet plays a dominant and active role where learning materials are

delivered, learning process is moderated and context of learning is designed for learners who comparatively assume a passive role. However in mLearning, the learners are activated by the mobile computational devices to interact with the physical, conceptual or abstract place to do and think during the learners' learning process.

Goth, Frohberg & Schwabe (2006) argue that the real physical context of learning or the immediate environmental setting of the learner should be the main foreground of the learners' focus in the learning process whereas the mobile devices (mobile phones, PDA, smartphones etc) should be the background of the learning focus which could be switched to the foreground of the user's attention instantaneously when needed but only temporarily as the learner need to return their focus to the environment. The role of computer device here is to enrich the physical environment on demand and allow additional activities. Hence, in mLearning, it is a passive role for the mobile devices in contrast to the learners' active role in being activated by the devices to do and think in their learning process. This active role is also the main characteristic shared in mobile learning type 1 as discussed above. In other words, the learner assume an active role in learning while the devices play a passive role in facilitating learning. Hence, e-learning and mLearning should be perceived as two different mode of learning, and by placing mLearning in e-learning would do injustice to mLearning. This characteristic of mLearning is in actual fact in contrast with electronic learning (e-learning) concept where in e-learning, computers assume an active dominant role in the learners' learning process where the computer delivers the learning material, moderates the learning process and designs the context of learning (Goth, Frohberg & Schwabe, 2006).

Augmented Formal Learning

The third perspective views mLearning as augmented formal education. This perspective attempts to unfold the misconception of formal education as categorized merely as a stereotype face-to-face classroom bounded learning as oftenly described in technology based or electronic based learning literature. However, the existence of distance education for over 100 years (Peters, 1998) evoked questions on relationship of mobile learning in all forms of traditional learning besides classroom learning. Therefore, it is natural to perceive mLearning as a support to traditional learning or even to enrich classroom learning as proposed in the curriculum design for mLearning in this study.

Learner-centred Perspective

The fourth perspective of mLearning argues that the focus of mLearning should not be in the mobility of mobile devices but rather the mobility of the user and content (Winters, 2003; Kulkulska, 2009) or learner centred (Winters, 2003). This perspective observes a shift of mLearning concept focussing on device to focussing on learners' mobility (Winters, 2003) or mobility of content (Kulkulska, 2009). Examples of definition based on this perspective would be 'any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes

advantage of learning opportunities offered by mobile technologies" (O'Malley et al.' 2003) while Lehner, Nösekabel, & Lehmann, (2003) define mLearning not only covers learning via mobile devices, network and wireless, but it has expanded covering any service or facility that provides a learner with general electronic information and educational content that assists in knowledge acquisition anywhere and anytime. This is supported by Kulkuska (2009) who suggested that devices learners use may be hardly relevant; what should be of importance would be the mobility and the construction of learning conversations in that process. However, Kulkuska (2009) did not deny of the influence of mobile device choice in learning. The availability of technology of learners in fact influences the learners' learning choice. For, example, language learning through mobile phones would be through oral conversation or electronic text (blogs) between learners; whilst learners who own a Nintendo DS, designed for games would engage learners to language learning games instead. Conversations between learners is a vital mode of learning in mLearning as defined by Nyiri (2002) which describes mLearning as learning which occurs when individuals communicate wirelessly.

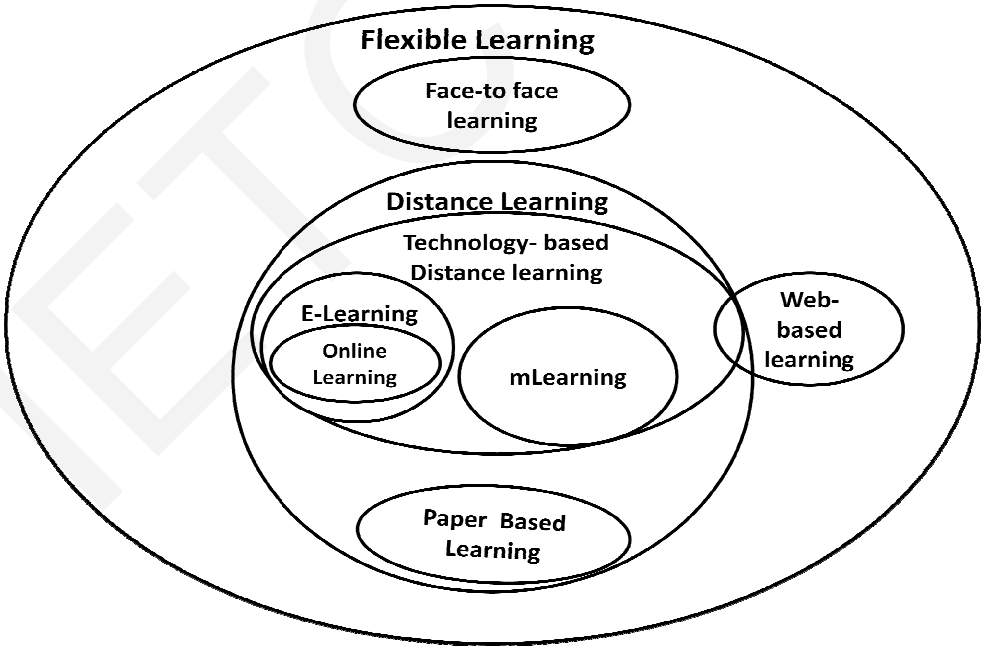
DISCUSSION

Based on the perspectives above, the mLearning elements: the mobile devices and applications, the learner (and the mobility of the learner), and the learning context or learning environment are inseparable and interact with each other to form mlearning. MLearning will cease to exist without the presence of any of the elements. Not only the elements need to interact with each other in order for the learner to be able to engage himself in mLearning; the elements develop each other in the process. To illustrate this, the learner needs to interact with his mobile devices and the context to develop his knowledge. Interaction between the mobile devices and the learner's immediate environment will enrich further the environment to improve learner's learning. Learner's progress in knowledge acquisition will lead to construction of new knowledge as a result of enriched learning environment. This will lead to new needs of learning, which then requires new development in mobile devices and applications; thus, the interaction among learners, the learning context and the mobile devices will further develop the mobile technologies.

However, in conceptualising and defining mLearning, the learners should be the focus
and at the same time assuming great importance of the role of mobile technologies and learning context. In other words as discuss earlier here, in mLearning, the learner plays an active role while the mobile devices and applications assume a passive one which is to enrich the physical environment on demand and allow additional activities. In supporting this view, Goth, Frohberg & Schwabe (2006) stated that the real physical context of learning or the immediate environmental setting of the learner should be the main foreground of the learners'focus in the learning process whereas the mobile devices (mobile phones, PDA, smartphones etc) should be the background of the learning focus which could be switched to the foreground of the user's attention instantaneously when needed but only temporarily as the learner need to return their focus to the environment.

Another important element which needed to be highlighted in conceptualising mLearning
is its unique attribute compared to other technology based learning in aiding learners to learn. In mLearning, students not only embark on knowledge constructions but they would also generate learning context on site that would also lead to more knowledge construction; the students may share common learning environment or context and develop the digital representation of the site or context using mobile technology. The site or context may not necessarily be a physical environment where the students is placed but could also be a network space or even a conceptual or abstract place such as a mutual learning subject or a learning problem (Nonaka, 1966). Laurillard (2007) terms this act of learning through generating context as 'digitally-facilitated site-specific learning' which is an intrinsic nature of mobile technologies which is not shared by other distance learning technologies such as desktop and landlines. This type of learning is very motivating as it offers learners a high degree of ownership and control. In the aspect of learners' motivation, besides degree of ownership and control, other affective forms of motivation afforded by mLearning are fun, communication, learning-in-context, and continuity between contexts (Jones, Issroff et al., 2007). This aspects of motivation offered through mLearning are another unique characteristic of mLearning to other forms of distance learning technologies.

Based on the consideration of the unique characteristics of mLearning to other form of distance learning technologies, a proposed model of mLearning is shown in Figure 2.



Source: Adapted from T. H. Brown (2005). Towards a model for m-learning in Africa. International Journal on E-Learning, 4(3), 299-315.

CONCLUSION

Mlearning is unique on its own; its attributes need to be separately defined from other learning technologies in conceptualising mlearning though it complements other forms of learning. In conceptualizing mLearning, at least three main characteristics of mLearning as discussed need to be considered whether in the design of learning or technologies : the roles of learners and technology devices; digital representation of learning settings and experiences; and the affective forms of motivation as focus of learning. The concepts proposed and discussed here are important in determining the direction of mlearning as future and sustainable learning for all.

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MODELING OF NEW IT STUDIES THROUGH DOZEN ASPECTS AND ISO/IEC STANDARDIZATION

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APSTRACT

This paper presents an original model 12 x n (covering 12 aspects in the n dimensions): 12 goals, 12 processes of curriculum activities, 12 expected resulting competencies of students etc. According to the presented model is shown the comparative analysis of the modified IT curriculum, including all the key principles and ACM/IEEE recommendations, as well as compliance with international programs with other universities in the region and the EU. Results of the model application are presented in the curriculum changes for IT, as complex process with many participants, and viewed through the prism of ISO/IEC standardization of IT through 12 segments.

Keywords: *IT, modeling, curriculum, standardization*

INTRODUCTION

Information technology (IT in further reading) are an enormously vibrant field that emerged in the middle of the last century as our society experienced a fundamental change from an industrial society to an information society, and in the end of the 20th century IT became a key element of the knowledge society.

IT are not just technology for the processing and use of information, and they have become an integral component of the curriculum as the new programs at the interdisciplinary, multidisciplinary, transdisciplinary (IMT in further reading) studies and similar directions in other areas/fields, providing a basis for effective and creative use of knowledge as key factors in the development of society. Therefore, the education and training of young people must not be left out of IT.

The aim of inovating IT curriculum is to produce a new model curriculum that could serve as a model for the IT basic academic studies and recommend ways of integrating curriculum with research and with professional practice. The curriculum model should incorporate innovations, best practices, continuous monitoring of news in the standardization, but need not be constrained by traditions that no longer make sense.

The IT field has been maturing rapidly and intensivly, and from a set of technology-oriented, autonomous disciplines it has become a profession. The specialties of the profession are many (over three dozen) and can be "placed" in the 12 ISO/IEC standardized fields or be grouped into three sets (Denning J. P., Athale R., Dabbagh N., Menascé D., Offutt J., Pullen M., Ruth S.(2000)) :

1 The IT specialities are concerned with aspects of computing and networking technology itself (Artificial intelligence, Computer science, Computer engineering, Computational science, Database engineering, Graphics, Human computer interaction, Network engineering, Operating systems, Performance engineering, Robotics, Scientific computing, Software architecture, Software engineering, System security);

2. IT-Intensive disciplines (Bioinformatics, Cognitive science, Digital library science, E-commerce, Genetic engineering, Information science, Information systems, InfoSec and Privacy, Instructional design, Knowledge engineering, Management information systems, Multimedia design, Telecommunications); and

3. IT infrastructure areas are staffed by professionals who implement, maintain, operate, and repair IT (Computer technician, Help desk technician, Network technician, Professional IT trainer, System administrator, Web services designer, Web identity designer).

The IT field is thus much more complex in character than computer science and presents completely new challenge to educators. Because the IT field is dominated by professional specialities, not just intellectual disciplines, its students need to be immersed in practice as much as in a study of concepts and principles. They need to learn to be professionals, which means they need to learn and embody their specialty's body of knowledge, its standards of practice, and its ethical codes of conduct.

Given that IT is a very new discipline, its focus is on developing educational programs that give students a foundation in existing concepts and skills. Modeling a curriculum for a set of related IT professional degrees today is not the only challenge. Because the half-life of technical knowledge is so short - and with "Internet time" continues to get shorter - in IT education we must pay special attention to fostering in its graduates the ability to continue learning new technologies with the constant application of standards throughout their future work. In addition, the IT market features a model of innovation that is quite different in character from the research model most familiar in universities.

IT are becoming an output profile in IMT field in higher education in our country, with recommendations of standards (such as bylaws, (Group of authors (2010)) for: 1) **15% of academic education subjects, 2) 20% of theoretical and methodological subjects, 3) 35% of scientific and expert subjects and 4) 30% of professional applied subjects.**

MODELING AND DESIGN CURRICULA FOR ACHIEVING THE OBJECTIVES AND COMPETENCIES THROUGH DOZENS ASPECTS

Modeling/designing of curriculum is guided by the ***outcomes x 12*** that the study program should achieve, i.e. it is essential to consider the goals of the program and specific capabilities that students need to have after graduation. This goals x 12 and associated techniques are used for determining whether the goals are met or they do not provide the foundation for entire curriculum.

The Objectives of the Study Program Through Dozen Aspects

The objectives of the study program are required by standard number 3 for the accreditation of academic programs on the first and second level of higher education (Group of authors (2010)).

Undergraduate studies of IT (2008 - Technical Faculty Cacak), with prescribed content and methods of work should ensure the objectives defined by the 12 aspects, and by analogy with own excellence model:

1) acquisition of professional competence in the field of IT and development of methods for their further development;
2) increase in technical and computer literacy for computer engineering;
3) acquiring academic skills in the IT field and related areas of technology (electrical engineering, mechanical engineering, automation, robotics, etc.) and the adoption of methods for their further improvement and development;
4) development of independence, analytical and critical approach to research and solve problems with IT;
5) international standardization in technical and technological areas and to transfer this knowledge in appropriate educational areas;
6) raising awareness and responsibilities of IT professionals for the development of economic, social system and environment;
7) creative development of innovative capabilities and skills to implement different development procedures;
8) acquisition of theoretical and methodological and theoretical basis for process management in business administration;
9) skills for managing peripheral devices in the IT;
10) training to create a software interface for application integration and configuration of computer system;
11) training students for further self-education and continuous updating of knowledge;
12) education and training professionals to work in specific areas of IT, but in many areas of IT application.

Basis of IT Curriculum Model

Information Technology (IT) in its broadest sense encompasses all aspects of computing technology. IT, as an academic discipline, focuses on meeting the needs of users within an organizational and societal context through the 1) **selection, 2) organization, 3) culture, 4) creation, 5) standardization, 6) networking, 7) visualization, 8) processes, 9) economy, 10) integration 11) knowledge and 12) application**.

According to ISO / IEC standardization and hierarchical classification, IT are classified into the field 35 (ICS 35). They are separated from the information science or science of information (ISC = 01.140) and classified in 12 standard segments.

Based on aspects of computer technology, IMT, processes 1-12 and IT standardization, model of IT curriculum is developed. This model is presented in Figure 1, in order to achieve quality and meet the required accreditation standards for academic programs on the first and second level of higher education (Group of authors (2010)) with a special focus on standard number 5.

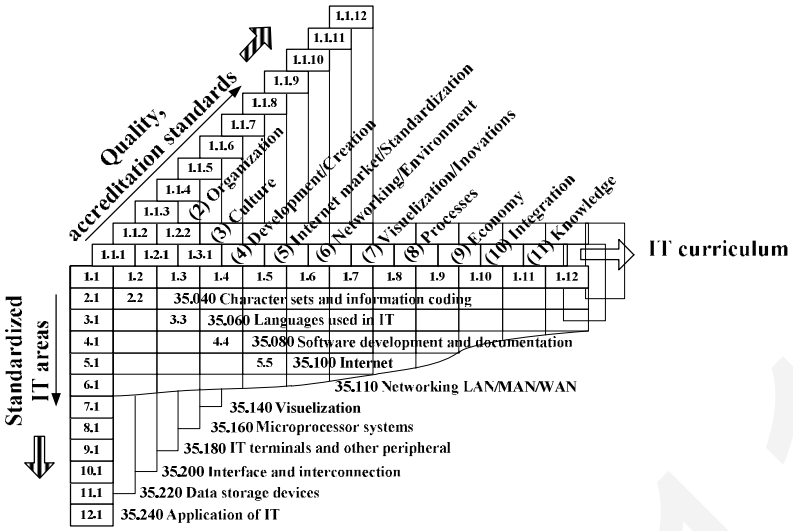

Figure 1: Basis of IT curriculum model

Competencies of Graduates Through Dozen Aspects

Graduates must possess the following skills upon graduation, namely the ability to:

1) collaborate in ***teams*** to accomplish a common goal by integrating personal initiative and group cooperation;
2) analyze, identify and define the requirements that must be satisfied to address problems or opportunities faced by ***organizations*** or individuals;
3) identify and evaluate current and emerging ***technologies*** and assess their ***applicability*** to address the users' needs;
4) ***design*** effective and usable IT-based solutions;
5) demonstrate an understanding of best practices and ***standards*** and apply them;
6) ***communicate*** effectively and efficiently with clients, users and peers both verbally and in writing, using appropriate terminology;
7) recognize the need for knowledge ***innovation***, to continue learning through the career;
8) assist in the creation of an effective project plan or ***business*** process and activities;
9) analyze the impact of technology on individuals, organizations and society, including ethical, ***economic*** and legal issues;
10) integrate solutions in the user ***environment***;
11) demonstrate that they ***know*** how to think critically and have the skills to solve problems;
12) use and ***apply*** current technical concepts and practice in basic IT.

COMPARATIVE ANALYSIS OF CURRICULUM AND INTERNATIONAL COMPLIANCE

In Serbia today, (in IT areas) students are being educated in academic and vocational studies (180 ECTS - IT engineer, 240 ECTS - graduate IT engineer, 300 ECTS - master IT engineer, 360 ECTS - specialist IT engineer, 300 + 180 = 480 ECTS - PhD - IT) in the area of IMT, with the participation of expert and professional applied subjects with about 40%, or 45% respectively, according to the recommendations of the *Commission for Accreditation of Quality Assurance* (Group of authors (2010)).

The Need for Innovation and Curriculum Compilance

IT as the academic discipline can be well characterized as the most integrative of the computing disciplines, which means that a graduate of an IT program should be the first one to take responsibility to resolve a computing need, no matter the source or description of the problem, and no matter the solution that is eventually adopted. The depth of IT lies in its breadth: an IT graduate would be the one to select, create or assist to create, apply, integrate, and administer the solution within the application context.

Dozen aspects of compliance with ACM/IEE - (Information Technology 2008 (2008)), we can find in Figure 2, where the pillars of IT are programming (programming fundamentals - 3 as well as integrative programming & software engineering - 4), Internet technologies - 5, networking - 6, Web design - 4, Web WGI -7, databases - 12, human-computer interaction 1 - 12, upgraded by technology platform - 10 (operating system - 4, computer architecture and organization 8 - 11, as well as computer infrastructure 8 - 9). Overarching the entire foundation and pillars are system integration and architecture, system administration and maintenance - 11, information management, information assurance and

security - 2, and social and professional issues. While this figure does not depict all aspects of the IT discipline, it does help to describe the relation of the key components.

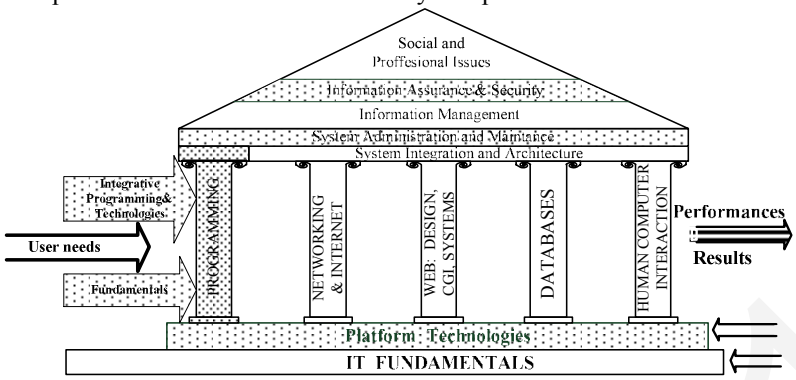

Figure 2: IT as academic discipline (adapted from Information Technology 2008 (2008), p19)]

Technical advances over the past decade have increased the importance of many curricular topics, such as the following: Introduction in ICT (ICT 1, ICT 2, 1-12), Security (2), Object-oriented event-driven programming (3), The World Wide Web and its applications (5), Client-server technologies (6), Networking technologies, particularly those based on TCP/IP (5+6), Systems administration and maintenance (2+4+6+8+9+10), Graphics and multimedia (2+7), Web systems and technologies (5), Service-oriented architecture (5+6+9+10+12), E-commerce technologies (12), Relational databases (12), Interoperability (12), Technology integration (4+12), Sophisticated application programmer interfaces (APIs) (10), Human-computer interaction (1 - 12), Application domains (12).

International and Regional Compilance Curriculum with EU

With the aim to verify the compliance of the innovated IT curriculum model several programs have been discussed. As representative examples from EU countries are taken Faculty of IT (FIT), Brno from Czech Republic, Faculty of Informatics sciences and techologies, in Crema, University of Milano from Italy, while from the region is set aside for the purposese of this analysis Faculty of IT in Mostar, from "Dzemal Bijedic" Univesity, Bosnia and Herzegovina, with the accredited programs of IT studies.

From non-informatics subjects alignment was performed for: Mathematics (Discrete matematihcs, Mathematical analysis, Numerical methods and probability, and probability Statitistic Fundamentals of Engineering Mathematics), Physics (Physics - compulsory or elective), English language, Circuit Theory and Signalisand Systems, Electronics and Automation and industrial measurement (as elective), Technical Drawing and Modeling and Operational researches in industry. From socio and humanistic science are coordinated (as compulsory): Principles of Economics and Business, Sociology, Reporting (FIT, Mostar), Benchmarking (Technical Faculty, Cacak), and as the election subjects Communication Skills, Personality psihology, Business Management, Educational Psyhology, Engineering Pedagogy and Didactics at the FIT in Brno, Business Processes Management (Faculty of Informatics Sciences and Techologies, Crema), Psychology, Marketing, Management of Changes (Technical Faculty, Cacak).

The results of comparative analysis of the above-mentioned study programs - by key segments of the IT field with the appropriate ECTS (where elective subjects are marked with *), with our domestic, innovated model from Technical faculty are shown in Table 1.

Table 1: Comparative analysis of IT study programs (segment of the key IT areas)

Faculty of IT, Brno, Czech Republic Academic year 2011/2012 [1]	Faculty of Informatics sciences and techologies, Crema, University of Milano, Italy, Academic year 2010/2011 [2]	Faculty of IT, "Dzemal Bijedic" University, Mostar, Bosnia and Herzegovina, Academic year 2010/2011 [3]	Technical Faculty Cacak, University of Kragujevac, Academic year 2010/2011 [4]
Subject and ECTS	Subject and ECTS	Subject and ECTS	Subject and ECTS
Algorithms (5)	Algorithms and Data Structures (12)	Algorithms and Data Structures (6) O-O Analysis and Design (7)	Data Structures and Algorithms (6)
Assembly Language (6) Formal Languages and Compilers (5) Principles of Programm. Languages (5) Introduction to Programm. Systems (5) * Programming .NET and C# (5) ...	Programming (12) Formal Languages and Automates (6)	Introduction to Programming (8) Programming I (7) Programming II (7)	Introduction to Programming (5) Programming Languages (5) O-O Programming (6)
Introduction to Software Engineering (6) OS (5) IS (4) * Pract. Aspects of Software Design (5) ...	OS I (6) OS II (6)	Introduction to OS (6) Server OS (5)	Introduction to IS(6) OS (6) IS (6) Software Engineering (5)
Computer Commmunications and Networks (5)	Computer Networks (12)	Computer Networks (5)	* Computer Networks and Commmunications (5)
Network Applications and Network Administration (5) * Web Design (5)	* Technology and Languages for the Web (6)	Web Technologies (7)	Internet Programming (5) Web Technologies (5)

Subject and ECTS	Subject and ECTS	Subject and ECTS	Subject and ECTS
Computer Graphics Principles (6) Modelling and Simulation (6)		* Computer Graphics (4)	Computer Simulation and Animations (4)
Computer Hardware (5) Microproc. and Embedded Systems (6) * Microcomp. Control of Electrical Drives (6)	Computer Architecture I (6) Computer Architecture II (6) Microprocessors Architecture 1 (6) Microprocessors Architecture 2 (6)	Computer System Architecture (7)	Computer Systems Organization (6)
Design of Computer System (5) Database Systems (5) Fundamentals of Artifical Intelligence (4) Term Project (2) * Personal Computers in Measurement (6) * Industrial Automation (6) * Medical Applications in Informatics (5) * IS Project Management (5) * Personal Computers (5) * Computer Aided Design (6)	Databases (12) Signal and Image Processing (6) * Privacy and Security Elements (6)	Introduction to IT (7) Introduction to Databases (5) Communication Technologies (7) Databases Managing Systems (7) Management and IS (5) Information System Designing (7) Sofware Engineering (8) * Human-Computer Interaction (4) * Principles of E-business (4) Project (11)	IT (6) IT project - Professional Practice (4) Intelligent Systems (5) Databases (6) Business Computer Applications (6) * CAD/CAE designing (5) * E-business (5) * Software Tools (5) * CAD/CAM Technologies (5) * IT in Education (7) * E-learning (7) * Program Control of Machines (6) * Modern Software Architecture (6)

[1] Faculty of IT, Brno, [2] Faculty of Informatics sciences and techologies, Crema, [3] Faculty of IT, Mostar, [4] Tecnical faculty, Cacak

In order to complete coverage of all 12 standardized IT segments, at FIT from Brno are studied: Peripheral Devices (4 ECTS), User Interface Programming (4 ECTS), Scripting Languages (5 ECTS), Advanced Assembly Languages (5 ECTS), The C++ Programming Language (4 ECTS), Java Programming Language (4 ECTS), VHDL Seminar (4 ECTS), MS Windows for Desktop Systems (5 ECTS), MS Enterprise Solutions (5 ECTS), Security and Computer Networks (4 ECTS) and Multimedia Transmission over IP Networks (4 ECTS), LAN Switching (4 ECTS), Accessing the WAN (4 ECTS), MS Windows Network Technologies (5 ECTS), which allows further adjustments (for 3+1+1 years).

The new model of IT studies is a formally and structurally aligned with modern world trends and the status of the profession in the IT area. It offers students the latest scientific and technical knowledge and trends in the field of IT. Given the model is a comprehensive and compatible, both with the models from European educational space (Table 1, columns 1 and 2), and with the model from region (Table 1, the 3rd column), with complete coverage of all 12 standard segments of IT.

RESULTS OF THE APPLICATION OF THE PRESENTED MODEL/MODELING

Given the trends of knowledge innovation in the field of IT through the prism of standardization, above mentioned technical considerations and ACM/IEEE recommendations, Table 2 shows the results of application of ***innovation*** model of the accredited undergraduate IT study program (where elective subjects are marked with *), with the representation of the expert and profesional-applied subjects through 12 standardized segments of IT, including ACM/IEEE recommendations (Information Technology 2008 (2008)).

Table 2: The expert and profesional-applied subjects in the accredited undergraduate IT studies, through 12 standardized IT segments (Micic Z. (2005))

<table>
<tr><td>R.br.</td><td>ICS</td><td colspan="11">Expert and proffesional applied subjects</td></tr>
<tr><td></td><td>35.xy0</td><td colspan="2">Subject in one IT segment</td><td colspan="9">Subjects in more than one IT segment</td></tr>
<tr><td>1.</td><td>.020</td><td colspan="2"></td><td colspan="3"></td><td rowspan="13">IT</td><td rowspan="13">IT Project and Professional Practice</td><td rowspan="13">Operating Systems</td><td rowspan="13">Web Technologies</td><td rowspan="13">Business Computer Applications</td><td rowspan="13">* IT in Education</td><td rowspan="13">* E-leraning</td><td rowspan="13">* Program Control of Machines</td><td rowspan="13">* E-bussines</td><td rowspan="13">* Modern Software Architectures</td></tr>
<tr><td rowspan="2">2.</td><td rowspan="2">.040</td><td colspan="2">Data Structures and Algorithms</td><td colspan="2" rowspan="3">Software Tools*
Software Engineering</td></tr>
<tr><td colspan="2">Multimedia Systems
Security</td></tr>
<tr><td>3.</td><td>.060</td><td>Introduction to Programming
Programming Languages
O-O Programming</td><td>IS Introd. to IS</td></tr>
<tr><td>4.</td><td>.080</td><td colspan="2"></td><td colspan="2" rowspan="2">* Computer Networking and Communications</td></tr>
<tr><td>5.</td><td>.100</td><td>Internet Programming</td></tr>
<tr><td>6.</td><td>.110</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>7.</td><td>.140</td><td>Computer Simulations and Animations</td><td colspan="3"></td></tr>
<tr><td>8.</td><td>.160</td><td colspan="2"></td><td colspan="2" rowspan="4">Computer System Organization</td></tr>
<tr><td>9.</td><td>.180</td><td colspan="2"></td></tr>
<tr><td>10.</td><td>.200</td><td colspan="2"></td></tr>
<tr><td>11.</td><td>.220</td><td colspan="2"></td></tr>
<tr><td>12.</td><td>.240</td><td>Inteligent Systems
Databases
* CAD/CAM Designing
* CAD/CAM Technologies</td><td colspan="3"></td></tr>
<tr><td></td><td>35.</td><td colspan="2">Σ = 10 subject (8 compulsory + 2 elective)</td><td colspan="3">Σ = 6 subject (4 compulsory + 2 elective)</td><td colspan="5">Σ = 5 compulsory subject</td><td colspan="5">Σ = 5 elective subjects</td></tr>
</table>

The new curriculum has been successfully integrated into a model study 3+1+1 (year) and should be accessible to a wide range of students (more than 4+1 or 5+0), as too often happens that such a curricula attracts a homogeneous population with relatively few females and students with an ethical, social or economic backgrounds that are not dominant in a given environment. It is necessary to provide a greater diversity, both by eliminating bias in the curriculum and by actively encouraging a broader group of students to participate (Information Technology 2008 (2008)).

The new curriculum must provide students with a capstone experience, but also with a habit to continually innovate their knowledge with the experiences that offer them a chance to apply their skills and knowledge to solve a challenging problem, also the curriculum should include a final one-year project, which requires that students use a range of exercises and techniques in solving basic problems, taking into account that there are aspects of IT disciplines that can not be adequately presented in the classroom, and that those skills can be learned only through the practical work. (Information Technology 2008 (2008)).

During the application of the presented model with 12 aspects of ISO/IEC, the plans were made for each subject through 12 thematic aspects (since the subjects are one semesteral, with 15 working weeks, which is also practical and instructive and produces results, etc.).

CONCLUSION

Centuries-long trends suggest that the role and place of agriculture in in the eighteenth century are more occupied with IT and services, towards knowledge society in the 21st century, which also requires a higher level of consciousness, culture, driven by the expected outcomes and competencies.

The presented model 12 x n provides the basic structure for curriculum development and can be used as a platform for the classification, given the coverage of all IT segments. The model contains all the essential elements which are necessary to build a curriculum which is fully functional, effective and dynamic, promotes innovation, creativity and professionalism, despite the fact that curriculum design requires some adjustment at the local level. Components that are examined in this work are necessary to create mechanisms to respond to constant changes in the environment.

The presented curriculum reflects the integrity and character of IT as an independent discipline, given that IT is characterized by a combination of theory, practice, knowledge and skills in more areas/fields (IMT studies), and IT curriculum ensures good practice .

IT curriculum as a whole maintains a consistent ethos that promotes innovation, creativity, and professionalism. Throughout the entire curriculum, students should be encouraged to use their initiatives, standards and imagination to go beyond minimum requirements and to maintain a professional and responsible attitude from the very beginning.

The innovated curriculum responds to the rapid technical change and inspires students to do the same themselves, because IT is a "living" area that is rapidly changing and therefore the IT curricula must be regularly updated. It is created to teach students to respond to changes in the same way, so that they could respond to the change as well and become lifelong learners, while the faculty staff should constantly look for better ways to deliver the curriculum because a constant improvement should be a hallmark of a healthy IT program.

Acknowledgment: The work presented here was supported by the Serbian Ministry of Education and Science (project III 44006, http://www.mi.sanu.ac.rs/projects/projects.htm#Interdisciplinary)

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MULTIMEDIA INTERACTIVE DEVELOPMENT FOR PRESCHOOL WITH HOLISTIC AND SPIRITUAL APPROACH

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This research is conducted due to develop a preschool multimedia interactive software (MICFruit) with holistic and spiritual approach that illustrate ten (10) local fruits in Malaysia. It is developed based on our National Preschool Curriculum and National Preschool Standard Curriculum components focuses on spiritual, physical, behavior and socio-emotion, language and communication, mathematic and pre-logic, sensory and environment, creativity and aesthetic. Learning process will enhance student's motivational through dynamic and interesting method combining multimedia elements that stimulates the senses of auditory, sensory and touch integratically. This development consists of many important decision-making stages such as analysis, design, development, implementation and evaluation (ADDIE model). Final expectation from this research is to harvest an appreciation value to our Creator and specifically fruit as the creation among children in the aspect of physical, emotional, spiritual and intellectual form.

Keywords : preschool, multimedia interactive development, holistic, spiritual

INTRODUCTION

In Malaysia, preschool education involving children aged five to six years. These children should be provided with knowledge before commencement of obligatory education at age 7 years old. Education given to children should include all aspects of life to produce balance and holistic child development. The aspects that need to be given attention in the development of childhood are the physical, intellectual, emotional and spiritual aspects.

According to Kamaruddin (1996), *fitrah* (nature) of the children is divided into two; physical and material related to this world and spiritual aspects that relate to God and hereafter. Physical and material are the basic needs in life such as shelter, food, drink and clothing. This nature allows the child to live comfortably. Meanwhile, spiritual refers to the needs of the soul. Exposure to know God is to prevent the child a sense of loss and emptiness in their hearts. Both *fitrah* will cause the child a sense of calm and secure in the love of parents and mercy of the Creator. The potential of the children are grouped into several aspects known as, intellectual, spiritual, emotional, physical and social. All these aspects need to be developed and monitored to produce a balanced child potential.

At the First World Conference on Muslim Education held in Mecca in 1977 emphasized on the balanced growth of total personality of man through the training of man's spirit, intellect, the rational self, feelings and bodily senses. Education should therefore cater for the growth of man in all aspects; spiritual, intellectual, imaginative, physical, scientific, linguistic, both individually and collectively and motivate all these aspects towards goods and the attainment of perfection. The ultimate aim of Muslim education lies on the realization of complete submission to Allah at the level of the individual, the community and humanity at large (Mahayudin, 1999 cited in Wan Noor Hazlina Wan Jusoh & Kamaruzaman Jusoff, 2009).

The awareness of having holistic approach in education has been a major concern to the Malaysian education system (Rohana Hamzah et al., 2010), stated in The Malaysian Education Philosophy (MOE, 2010):

> "Education in Malaysia is on-going efforts towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonic, based on

> a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving high level of personal well-being as well as being able to contribute to the harmony and betterment of the family, the society and the nation at large".

The above definition defined a holistic approach in education as an approach focused more on the whole teaching and learning process in education (Rohana Hamzah et al., 2010).

Thus, with the advance development of information and communication technology (ICT), Muslim educators need to equip themselves with ICT skills especially multimedia in order to cater the growth of students in all aspects; spiritual, intellectual, imaginative, physical, scientific, linguistic, both individually and collectively. If we fulfill this, only then we able to produce balanced students spiritually, physically and mentally, because multimedia tools are part and parcel of their lives nowadays (Wan Noor Hazlina Wan Jusoh & Kamaruzaman Jusoff, 2009).

Computer and multimedia technology offers tools that are very special so called "mind tools". This is due to many applications use this technology in the science subjects that assist teachers in teaching and learning of children involving the use of the mind. Children incorporate information through observation and describing objects, animals and plants as part of a scientific study on their age level. Children also make the collection, ask questions, and talk about science in front of classmates (Feasy & Still, 2006).

MULTIMEDIA INTERACTIVE DEVELOPMENT

The findings of an observation and interview involving preschoolers and preschool teacher in National Children Development Research Center (NCDRC), Sultan Idris Education University towards analysis phase are as follows (Nor Azah & Marzita, 2009):

- the combination of text and audio are preferable due to its easiness and clarity
- children are more likely attracted towards motion and sound
- CD design selection should integrate audio and animation elements such as singing and dancing, stories with cartoon elements
- Concept are based on exploration
- Preferable colours are bright and colourful colours.

To develop a successful interactive multimedia software in the eyes of children, developer have to let the children be in control, work at their own pace, manipulate the system, play a role in the action, create, see the things done on the screen immediately, have feedback that is not too delayed, and have goals either set for them or set by them (Normahdiah Sheik Said, 2007). Design for children is different than design for adults as follows (Kelly, n.d.):

- children are much more critical
- children have no patience. For example, they click before they listen and often (especially boys) need to return to something a number of times before they really get it, not because they are unintelligent but because they are trigger happy
- children don't read (not counting if they are too young to read)
- children want clear responses and intelligent systems
- children need a lot of feedback and like to have a lot of interesting instructions and encouragement when there is a learning challenge
- children need reinforcement of their experience on the computer in the classroom or outside/ beyond the computer
- kids never ask why do I need this programme; adults are much more skeptical
- the computer is a huge motivator for kids

MicFruit development consists of many crucial decision-making stages such as analysis, design, development, implementation and evaluation (ADDIE model). Within analyzing phase, the instructional problem is clarified, the goals and objectives are established, and the learning environment and learner characteristics are identified. Design phase is a phase where instructional strategies are designed and media choices are made. In the developmental phase, materials are produced according to decision making in design phase. The implementation phase included testing of prototypes (with targeted audience) and putting the product in full production. Formative evaluation is presented in each stage

whilst summative evaluation covers criterion-related reference items test and providing opportunities for user's feedback (Nor azah et al., 2010).

The development process starts with identifying targeted users and analyzing their needs, studying and comparing preschool interactive multimedia on the market by identifying its strength and weakness in the context of multimedia elements usage (text, graphic, animation, audio and video), interface, navigation, colour blending and so forth, developing storyboard, acquiring material, manipulating and editing multimedia elements, integrating multimedia elements within authoring software and evaluation followed by producing and managing preschool interactive multimedia software. A high commitment is required in every development phases to produce appropriate and interesting interactive multimedia software, hence fulfilling targeted user's need which is the preschool children.

MULTIMEDIA INTEGRATION WITH HOLISTIC AND SPIRITUAL APPROACH

MicFruit is developed based on holistic and spiritual component, focuses on local fruits topic as stated in National Preschool Curriculum 2006 (*Kurikulum Prasekolah Kebangsaan*) and National Preschool Standard Curriculum 2010 (*Kurikulum Standard Prasekolah Kebangsaan*). It also highlights the principle of learning, reading and experiencing meaningful and fun learning through science process and problems need to be solved by preschoolers. Fruit (durian) with holistic and spiritual approach is as follows:

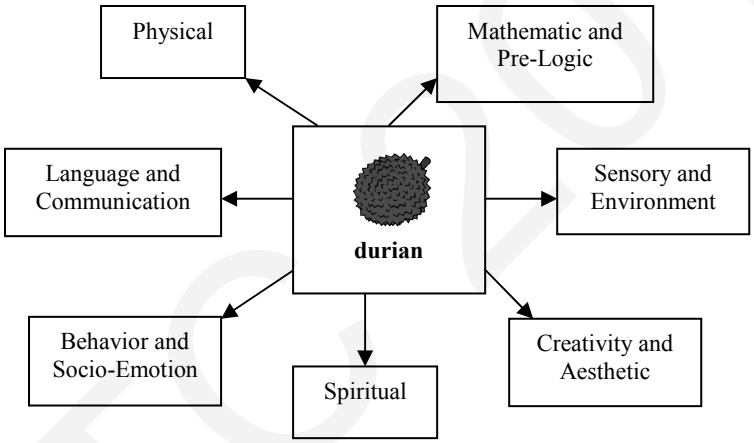

Figure 1.0 Micfruit With Holistic And Spiritual Approach

Referring to Figure 1.0, the elements included in the Micfruit with holistic and spiritual approach are as follows:

Component	Content
Physical	• select color • select size • rearrange durian's life cycle • sing the durian song
Behavior and Socio-Emotion	• thankful for God's creation – say Alhamdulillah, • feel pain when touched durian skin – Ouch! Careful, sharp thorns
Mathematic and Pre-Logic	• durian's life cycle simulation • classifying colors, size and shape
Language and Communication	• Name • Skin texture • Flesh and Seed

	• Size, Shape and colour
Sensory and Environment	• where to grow durian • durian taste • favourite fruit
Creativity and Aesthetic	• coloring durian • durian used to flavour, ice kacang, dodol, ice cream and etc
Spiritual	• Alhamdulillah - Allah produced a durian tree and Allah also make durian flowering and fruiting • scales must be accurate • think what can be produced by durian –Allah loves those who think • sing a song to appreciate Allah's creation

Table 1.0: Holistic And Spiritual Component

An advantage of MicFruit other than holistic and spiritual approach is that it gives opportunity to the preschool children from being passive viewers of multimedia to active participants. Interactivity allows the user (preschool children) to explore a multimedia program according to preferences of children themselves. Children can jump from one topic to another topic in non-linear form. MicFruit used JABA as a guider or character of a friend or assistant who can guide them throughout the application.

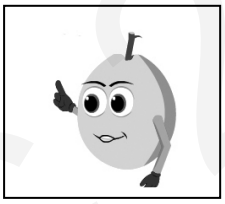

Figure 2.0: JABA

JABA will guide preschoolers throughout the application and help children to answer questions. This software is also able to help improve children's understanding of scientific concepts related to plants or specifically local fruits in Malaysia.

Figure 3.0: MicFruit Interface Design

CONCLUSION

Final expectation from this research is to harvest an appreciation value to our Creator and specifically fruit as the creation among children in the aspect of physical, emotional, spiritual and intellectual form (holistic approach) as stated in The Malaysian Education Philosophy.

ACKNOWLEDGEMENTS

This research was supported by Sultan Idris Education University, Tanjong Malim, Perak, Malaysia.

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USING THE INTERACTIVE LEARNING ENVIRONMENT APLUSIX FOR TEACHING SCHOOL ALGEBRA: A RESEARCH EXPERIMENT IN A MIDDLE SCHOOL

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Abstract
Most software tools that have been developed with the aim of helping students to learn school algebra have not yet achieved successful results in classroom. Almost all of them are menu-based systems that provide transformation rules in menus and buttons. Aplusix is a new interactive software tool for learning school algebra. In contrast to existing software tools in mathematics education, Aplusix has been developed to allow students to freely build and transform algebraic expressions as they can do on paper. In addition, Aplusix provides appropriate feedback and interactivity, and as such, it becomes a source of learning. This work reports on a research project on the investigation of students' learning of elementary algebra with Aplusix. The work uses the Theory of Didactical Situations to analyze and evaluate the learning potentialities of Aplusix. The paper also reports on implications for the learning of school algebra and the integration of Aplusix into mathematics classroom.

Key words: Aplusix, learning, mathematics education, school algebra, Theory of Didactical Situations, utility value

Introduction

The difficulties of learning school algebra in a paper-pencil environment relate to different analyses: The evolution from procedural to structural conception (Sfard, 1991), semantic/syntactic difficulties (Drouhard, 1992), the transition from arithmetic to algebra (Vergnaud, et al, 1988), the status of letters and the notion of variable in algebraic expressions (Kieran, 1992). Another difficulty is that algebra is often seen as a formal, isolated system where manipulations of symbols are often dominating (Kieran, 1991). There has been a great deal of research in teaching and learning school algebra the last 15 years (Kieran, 2007). However, despite the fact that researchers know relatively more about the learning of algebra, a great deal remains to be researched, in particular the integration of ICT into classroom. Several software tools aiming at helping students to learn algebra, have been developed, but few of them have achieved successful results in classroom yet (Kieran, 2007; Zbiek, Heid, & Blume, 2007). A promising interactive software tool in school algebra is Aplusix (Chaachoua, Nicaud, Bronner, & Bouhineau, 2004; Nicaud, Bouhineau & Chaachoua, 2004). The aim of this research work is to gain theoretical and practical insights into the learning and teaching of school algebra within the interactive environment of the software tool Aplusix. The remainder of the work is structured as follows. First, the theoretical framework is outlined. Second, the literature review is reported. Third, the research experiment in a middle school is described. This is followed by the data collection methods. The evaluation results are then outlined. Some implications on the use of Aplusix for the learning and teaching of school algebra conclude the article.

Conceptual Framework

The modes of use of Aplusix depend on the chosen conceptual framework in terms of interactions with the students in classroom. The Theory of Didactical Situations (Brousseau, 1997) is one of the most appropriate frameworks for investigating interactions with Aplusix. According to the Theory of Didactical Situations (TDS), learning occurs by means of interaction between learner and a "milieu" (Figure 1).

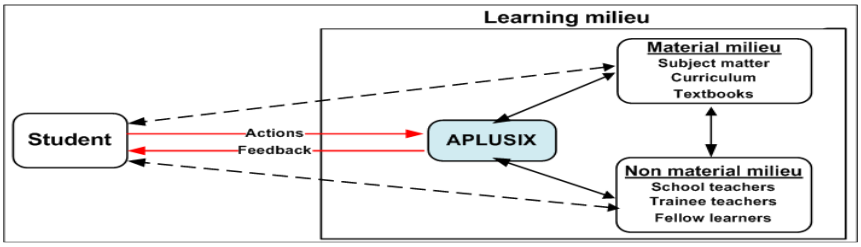

Figure 1: Interactions of the student with the "milieu" according to TDS

Each action of the student in the "milieu", which consists of a material and non material "milieu" (Figure 1), is followed by a feedback of the "milieu" itself, which generates difficulties and contradictions. Learning happens through adaptation of the student to the "milieu". Aplusix can be considered as an element of the "milieu", and as such, its feedback becomes a source of learning. Aplusix provides three categories of feedback (Nicaud, Bouhineau & Huget, 2004): Feedback about the equivalence of expressions, feedback on the state of the current step provided by indicators in the software, and feedback provided by textual messages. The role of the teacher is that of setting a situation or experiment in which students interact with Aplusix to achieve a given educational goal (Cerulli, Pedemonte & Robotti, 2005).

Teaching Experiments with Aplusix: Literature Review

Several experiments with Aplusix have been carried out in mathematics education in different countries (Bouhineau et al, 2005; Nicaud et al, 2006; Nicaud, Bouhineau & Huget, 2004): remediation piloted by researchers in Italy; remediation integrated into the regular functioning of classes in Brazil; collaborative learning in India, and regular use during an entire year in France. On the basis of these experiments, researchers (Bouhineau & al, 2005) concluded that Aplusix has been shown to be a usable computer system, favoring the students' learning of school algebra. In addition, the cost of integrating Aplusix into the teaching of algebra is low. Furthermore, the students gained autonomy and improved their knowledge. Finally, Aplusix facilitated the teachers' work because of the students' autonomy and of already-made lists of exercises. However, despite the promising benefits of Aplusix, research work still remains, among other things develop adapted experiments for many features of the software, collect a large number of protocols and study transformation rules by-hand, use an algorithm to diagnose the transformation made by the students, narrow the domain (in order to get more actions for each student on one domain), determine typical conceptions of students in this domain, and use of Aplusix for a very large number of students, exploiting the feedback of Aplusix to mediate the equivalence between algebraic expressions (Maffei, Sabena, & Mariotti, 2009), and understanding the relation between design and usage of Aplusix (Trgalova & Chaachoua, 2009). Finally, there is a need to perform comparative studies between different countries.

Experiments in Classes of Grade 10

Experiments with Aplusix took place in two classes of grade 10 having 30 students each and 2 teachers in a middle school. The major goal was to evaluate the student progress in learning after the training phase with Aplusix. The experiment consisted of a teaching sequence with four major phases. It is similar to the one described in (Nicaud, Bouhineau, & Chaachoua, 2004). First, a pre-test of 30 minutes, using paper-pencil techniques, was given to the students. Second, before any teaching of algebra, the students were introduced to the functionalities of Aplusix. Then, the learning of equation solving with Aplusix began with the training phase, using the feedback of the system. This phase had a two weeks' duration. Finally, a post-test of 30 minutes using paper-pencil techniques was organized in order to measure the students' progress in comparison to the pre-test.

Data Collection and Analysis Methods

Both qualitative and quantitative methods were used to collect data. Quantitative data collection consisted of three methods. The first one used pre- and post-test with paper-pencil techniques to measure the students' progress in learning school algebra between the pre- and the post test. The second method relied

on statistics that is automatically produced by Aplusix. The data collected statistically can be analyzed and displayed on the screen (Nicaud, 2006). These consisted of students' past activities such as attempted exercises, well-solved exercises, calculation errors, scores and time. The teacher can select the students individually in order to analyze their performances. Finally, a survey questionnaire was used to collect data about the utility value of Aplusix. The questionnaire used a five-point Likert scale from 1 to 5, where 1 is coded as the lowest and 5 as the highest.

Three methods were used to collect qualitative data. The first one used the students' protocols that are produced by Aplusix. Protocols permit the analysis of difficulties encountered by the students, their strategies used in the resolution of problems, the students' acquisition of relational understanding of the equal sign, and the analysis of exercises with bad percentage of success to identify possible didactical variables. The second method used semi-structured interviews with teachers (*N=2*) and students (*N=6*). The third method used observations of students' interactions with Aplusix. There are three types of interactions that can be observed: Student-teacher, student-student, and student-textbooks.

Results

Results are described with regard to the following issues: Students' understanding of the equal sign; students' performances in solving equations; students' algebraic strategies and resolutions, and utility value of Aplusix.

Students' Understanding of the Equal Sign

The exercises in the pre- and posttest contained similar tasks. The goal was to identify students who had a relational understanding of the equal sign both in the pre-and post-test. The results indicate a progression of 23% from the pre-test (11%) to the post-test (34%) with regard to the percentage of students who had a relational understanding of the equal sign (Table 1).

Pre-test (in %)	Post-test (in %)	Progression (in %)
11	34	23

Table 1: Students' progression in their understanding of the equal sign from pre-test to post-test

Students' Performances in Solving Equations

Regarding the students' performances in solving equations the following results were achieved (Table 2):

	Task	Pre-test (in %)	Post-test (in %)	Progression / regression (in %)
1	ax = b	68	90	22 %
2	–a = -bx	18	42	24 %
3	a/b*x = -c/d	2	0	-2 %
4	–ax+b = 0	21	24	13 %
5	ax+b = -cx-d	11	22	11 %

Table 2: Students' performances in solving equations

The results show that tasks using fractions (exercise 3) were very difficult for all students. Exercise 1 and 2, which were more familiar to the students, achieved a progression of 22% and 24% respectively. Most students (90%) solved exercise 1 in the post-test. Exercise 2 was interesting from a pedagogical point of view because it contains a didactical variable (the minus sign). Students had difficulties with this type of exercise in the pre-test (18%). It seems that Aplusix helped some students to solve this exercise (42% achievement in the post-test), a progression of 24%. Exercise 4 and 5 achieved lower results (13% and 11% respectively). This is not surprising since these exercises require the understanding of two didactical variables (the minus sign and the number zero).

Summarizing, the students' performances seem to be dependent on the task type (increase from 0 to 24%). In particular, fraction tasks were a very difficult problem for all students (-2% regression). In addition, problems with the equivalence principle play a role, and it may be well suited to train students with Aplusix.

Students' Algebraic Strategies and Resolutions

The following analysis is about the students who acquired a relational understanding of the equal sign in the post-test, that is to say an understanding of the equivalence principle. The analysis concerned their algebraic strategies they used to acquire such an understanding. The analysis was based on the students' protocols produced by Aplusix. To be able to reason algebraically and develop strategies students need to understand the equivalence principle, manipulate didactical variables, and solve complex equations. The following experiments show the steps the students went through to acquire an appropriate understanding of elementary algebra.

a) Understanding of the Equivalence Principle

The following examples (Figure 3 and 4) show a gradual learning process in three steps. First, the student was not able to use the equivalence principle correctly. In the second step, the student seemed to be able to make progress, before he/she managed in the third step to solve the exercise using the equivalence principle.

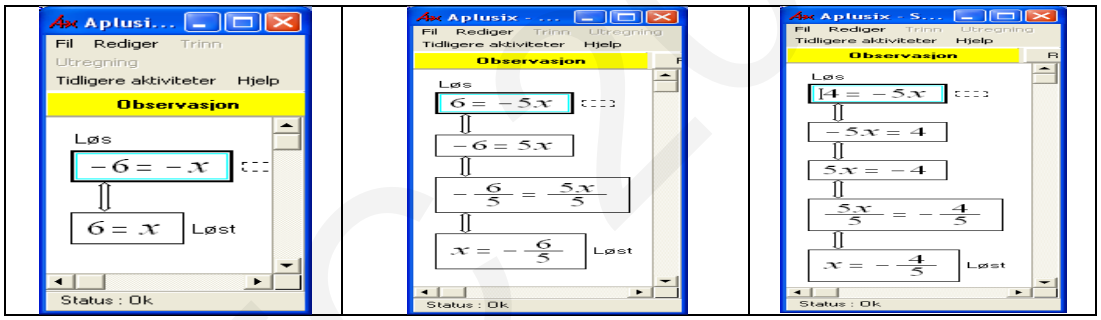

Figure 3: Example showing a gradual understanding of the equivalence principle

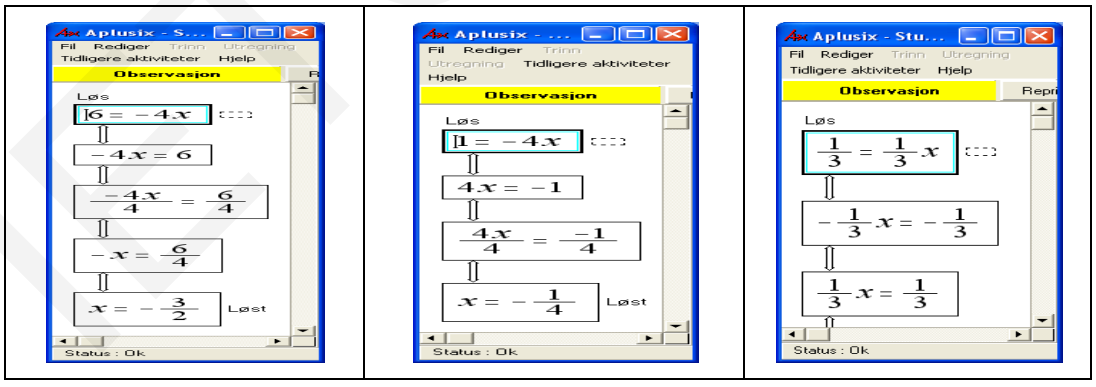

Figure 4: Example showing a gradual understanding of the equivalence principle

b) Use of the Didactical Variable Minus and Arithmetic Knowledge about the Number Zero

This example shows that the student was first not able to understand the role of the number zero and minus sign in algebraic equations. In the second step, the student improved her/his understanding of the didactical variables considered (Figure 5).

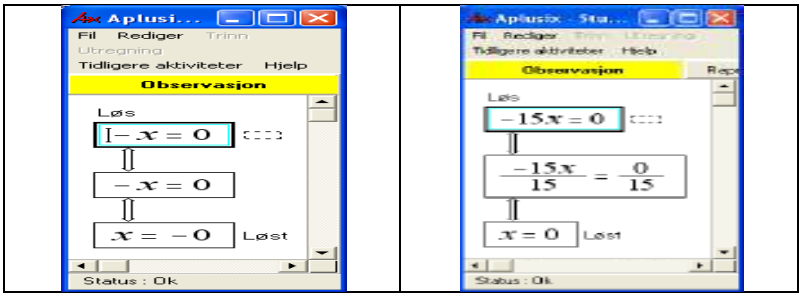

Figure 5: Example showing a gradual understanding of didactical variables

c) Solving Complex Equations

This example shows the students' ability to solve complex equations (Figure 6). It appears that the student made progress in solving complex equations in comparison to his/her performance in the pre-test.

Summarizing, the following conclusions can be drawn:

1. The lack of arithmetic skills may have been an obstacle to learning algebra. In particular, problems with the didactic variables fraction, minus, and zero, but also the lack of awareness of arithmetic conventions, such as omitted count characters and calculation priorities, leading to problems when solving equations.
2. The performance of many tasks seems to have helped the students' learning.
3. One way to help students to acquire an understanding of algebraic equations is to increase the number of equivalent steps in the solution process when using Aplusix.
4. Students, who had a relational understanding before they began to use Aplusix, could quickly increase their understanding and performance.
5. Several students used algebraic strategies in the post-test than in the pre-test.

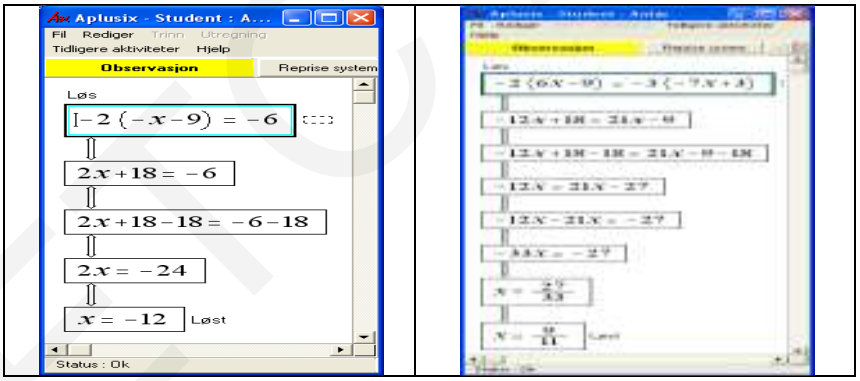

Figure 6: Example showing students' ability to solve complex equations.

The Utility Value of Aplusix

The utility value of Aplusix was evaluated on the basis on 5 criteria: Technical usability, pedagogical usability, feedback, differentiation, motivation, and interaction. The evaluation was carried out by means of survey questionnaires. The results achieved are as follows:

- *Technical usability*: There is a relatively large consensus that the program is easy to learn and to use for most students.
- *Pedagogical usability*: Aplusix seems to be pedagogically suited for both average and strong students, but students at a low level do not appear to have benefited from the software. The reason may be the students' limited prior knowledge, unfamiliar task types, and the mathematical language used in Aplusix. The students' different ways of working (Procedure-oriented, solution-oriented or reflected) seem to affect whether Aplusix may be pedagogically useful. The integration of Aplusix into classroom may have a positive impact on learning, even for students at a lower level.

- *Feedback*: Students from the analysis group (*N=13*), that is to say the group of students who changed their understanding of the equal sign from operational to relational, responded differently to feedback, either unstructured or structured trial and error or with a targeted improvement of the error. All ways of working with Aplusix lead to learning. However, it is difficult to conclude that this applies to all students.
- *Differentiation:* Teachers believed that Aplusix may be suitable for adaptation to some students' needs. Students' responses to the questionnaire indicate uncertainty in relation to differentiation opportunities among students.
- *Motivation:* At the beginning of the experiment with Aplusix all students were motivated and task-focused, and some of them were highly motivated. However, the motivation decreased over time, especially for weak students. Lack of prior knowledge can be a reason for decreased motivation.
- *Interaction:* Most students used Aplusix interactively. They needed little teacher help than in normal hours, and there were few interactions between with the "milieu" and the students. However, the interactions with the "milieu" (fellow students, teacher) were difficult to measure due to a number of contextual factors.

Conclusions and Recommendations

As with all educational research of this nature, it is difficult to conclude direct causality between the characteristics of the experiment and the learning effect of Aplusix since a number of contextual factors may implicitly affect the learning process. However, by considering the various parameters, both technical and pedagogical, that have been taken into account in this work, it has been possible to make some reasonable interpretations of the results. These indicate that Aplusix shows potential for learning school algebra, although not all types of students benefited equally well. Aplusix may have a positive impact on the students' learning if some conditions are met. Firstly, students need to have a basic knowledge of the relational understanding of the equal sign. Secondly, students should have prerequisites, especially a good arithmetic basis. Third, the design of didactical situations is important, such as choice of task types that are adapted to the students. Then, teachers' ICT expertise, both technical and didactical, is important. Furthermore, the time aspect needs to be considered, both for the learning and use of Aplusix. Finally, the integration of Aplusix into classroom could increase the value and benefit of the program for learning elementary algebra. This may be an important condition for improving student achievement and performance.

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NEW EDUCATION TECHNOLOGY IN CIVIL AVIATION STUDY

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ABSTRACT

Objecting to develop quality of study process we apply worldwide (International Civil Aviation Organization (ICAO)) European (European Aviation Safety Agency (EASA)) civil aviation education standards to study and practice process at our university. Starting form English language learning in foundation classes we modernize teaching - learning process of speciality subjects and built simulator practice center with Boeing, Airbus and ATR simulators for practice opportunities of both young specialist and students.

We resort general English language learning models of Turkish and aviation English learning models of UK universities, practice technology of USA, Germany, France and Lithuanian civil aviation institutions and distance learning opportunities offered in European universities. The process activated the students to research of study technologies and drive advantages. Hereby, the aim is to get target involving increasing number of students applying international study technologies such as ICT, distant teacher-student trainings and certification, networking and the like.

Keywords: aviation English, simulator center, distance learning, certification, networking

Introduction

There are some international education standards at civil aviation institutions that should be fulfilled by each of them. National Aviation Academy (NAA) works on two of them currently- International Civil Aviation Organization (ICAO) standards and European Aviation Safety Agency (EASA). One of major conditions of the standards is to obtain min. 4th level of ICAO Aviation English level for flight crew, proficiency in English language, the same study standards and systems of European High Education Institutions and aviation schools. NAA leads activities to obtain the standards: New buildings and campuses, special simulator center with apparatus, new curriculum, ECTS of evaluation, new methodology, young staff involvement, refreshment of editions and the like..

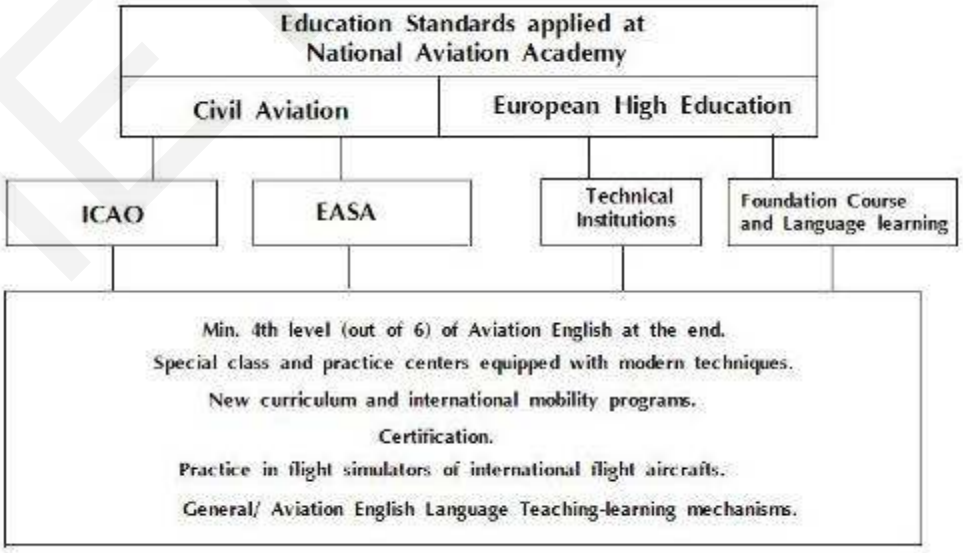

Fig. 1 *(General view of education standards at NAA)*

Since ICAO requirements are one of essentials, we start with fulfillment of ICAO standards from various aspects one of which is to abolish poor language problem. The problem is solved in two directions-organizing general and aviation English language courses in Azerbaijan and abroad and set teacher-student staff of NAA to these programs. These programs are evaluated from various viewpoints, so that participants start to learn or develop not only their language knowledge, but also observe modern language teaching–learning technologies applied in Europe. For instance, the aviation English course organized in July-August 2009 was helpful both for language development and practice that was organized at Lufthansa Training Center TRAINICO, it was a short term model of European language teaching. Short term courses were delivered by different lecturers and lead in non-similar methodology and participants were certificated at the end of the course.

NAA increased its activity in international projects direction and invited language, technical and aircraft specialists to lead courses and teach education technology usage in study process. The last hosted Fulbright specialists with BOEING and English Language Teaching background had prepared two program plans according to teachers and students courses. Teacher attendees of the program were shown what new technology is being used in American high schools nowadays and how a teacher can develop better class environment and get high results at the end. Moreover, participant-students were directed to benefit from internet resources, practice to study the subject both individually and in groups, develop critical approach to topics and the like. Especially language courses were highly evaluated both from certification viewpoint at the end as well as.

To strengthen its language capacity will make international flights for flight crew easier and thus, in general role of human factors-lack of aviation English knowledge that became a cause for air traffic accidents will decrease.

Study Process

Taking into account that NAA was established in 1992, we can say that civil aviation study in Azerbaijan is in its early stages. However, being young HE NAA has applied several important education standards and created real study atmosphere and is involving more and more students who want to study aviation. NAA objects to be the first and strong civil aviation HEI not only in the country but also in the region and develop rate of air transport in transport system of the region.

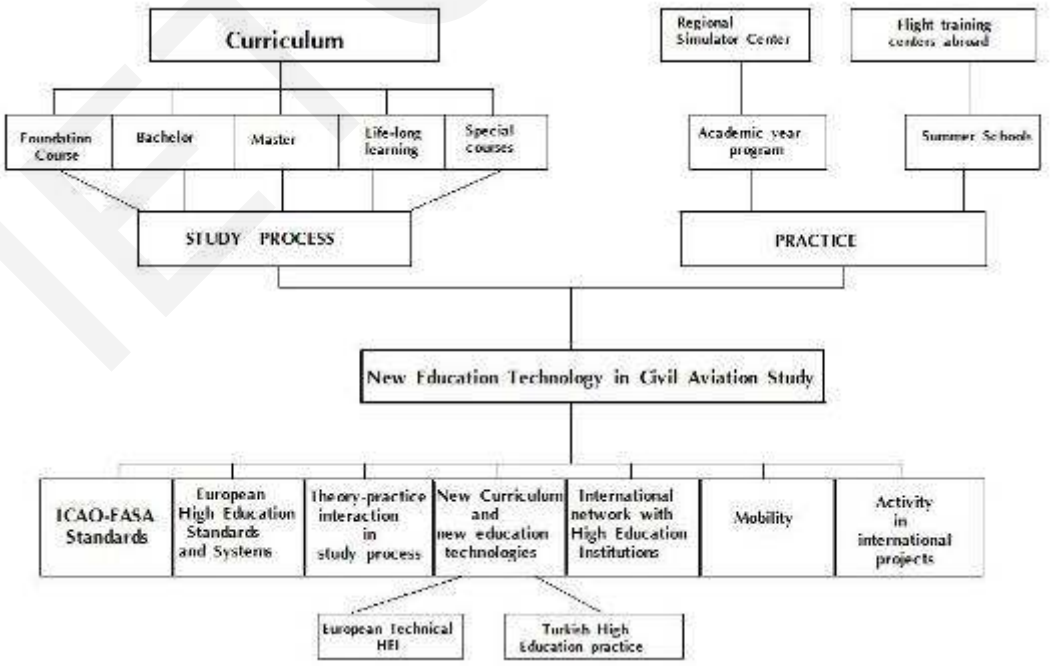

Fig. 2 *(Application of new technology to study-practice process of NAA)*

Now the development program is realized in various directions, special work schemas are prepared and sections were selected to carry out the work. Since civil aviation study system is divided into two main parts as study and practice, we need to teach theory and how to benefit from theoretical knowledge in the practice at the same time. Study sections obtain, foundation course, bachelor, master, long-term preparation, special trainings and the like, whereas, it includes practice in different aircrafts according to students' academic year. Both system refreshment projects include curriculum, renewal and European standards application. Our role in this multi-directed process is to organizing Foundation Course (FC) with modern study approach and special courses and programs using last study innovations and involve academic staff.

FC in English language plays a base role for bachelor degree where students continue to study their speciality in English only. It needs to point that NAA had native (Azerbaijan) and Russian groups beforehand and starting from 2008 we organized English language groups as well. FC will strengthen not only English language knowledge, but also strengthen its secondary school base of technical subjects such as math, physics, chemistry, informatics etc using new methodologies, techniques and curriculum. FC uses experience of famous HEI of Europe, new edited textbooks and involves young specialists to teaching processes. We start with new books in order to sweep away remnants of former Soviet textbooks and methodology. New course books and new curriculum system that is going to be applied in FC will make positive results. These textbooks are highly estimated as because there are both for teacher, student and class use. Sometimes we use several books in order to present unit textbook that will fit to language and topic standards of our program. Taking into account that language learning is the major language literature is core point. Special interest is given to audio-visual learning approach of language learning and therefore, audio books are of special interest. Thus, we applied some variants of language learning:

A. First of all, the student should strengthen language base.
B. Four major aspects of language learning (reading, writing, listening and speaking) are applied.
C. Four major aspects of language learning will be combined and taught in interaction.
D. Certification according to language knowledge.
E. The student has to be fluent in language and participate in various discussions and debates.

FC organizes special language learning classes such as lingophone class, discussion classes, distance learning auditoriums and the like. We plan to teach language together with innovative teaching technologies and mechanisms and therefore, we pay attention to computer-teacher and computer-student friendship strategy in our policy. All the subjects that will be taught in FC will be held with computers, tapes, projectors and others. Computers will help teachers not only to explain the subject with new methods, but it will also help them to organize the class and concentrate students on main topics. If to take into account that aviation English asks fluent speaking and listening abilities, we object to build student capacity in this direction with the help of tapes and computers. These capacities will also build during class and out of class activities. Different topics for discussions, dialogues and group works in every subject will development of students' listening and speaking abilities.

FC founds its archive and web source where we keep both class materials and out of class materials accessible for teacher-student staff. Resources are kept in hard copies and in electronic versions. Annually the library resources will be updated and refreshed with new study materials and student works. Besides, web sources that can be more beneficial for students, we set groups for every subject and it operates as mini class format where we see both student feedback, comments and discussions on given problem and teacher instruction and assisting.

System that we apply at FC is important from the viewpoint of knowledge evaluation, testing and certifying. So that we plan to open center where various testing materials and questionnaires will be prepared for students and it will help for placement, certification and identification of language level of the applicant. The center will use TOEFL, IELTS testing models and test samples, special language trainer and evaluator programs. These testing systems will be applied not only for students but also at teacher refreshment programs and candidate selecting procedures. Testing center will furnished with computers and special testing programs. Testing center staff is not allowed to lead classes and therefore, they will not have any background information about attendant.

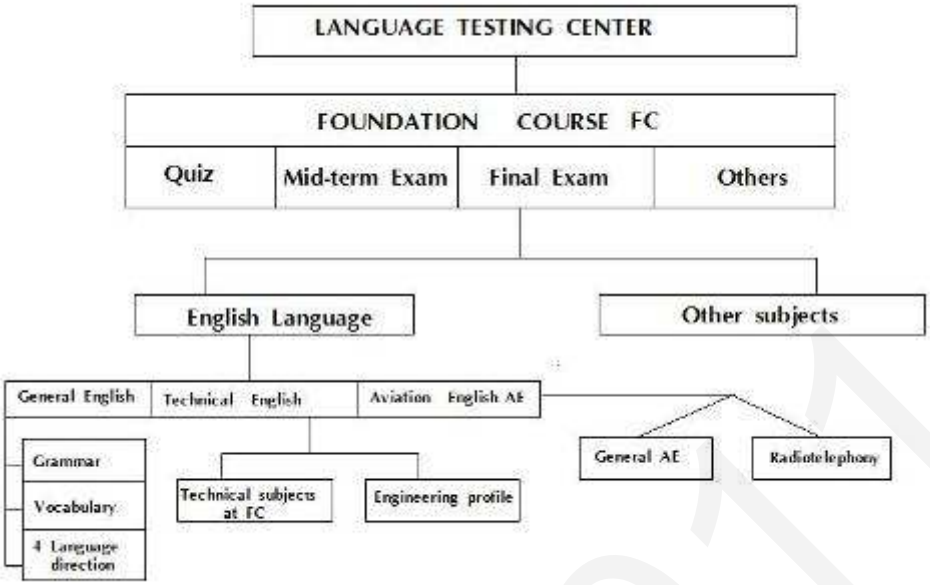

Fig.3 *(Language Testing Center diagram)*

Sections of the center are responsible for question base that will be prepared according to syllabuses used at FC and the resources should be renewed every term and keep in archive.

As it was mentioned above together with language we want students with basic technical knowledge. Study program obtains several technical subjects and specific approach accordingly. Selected subjects will be taught in special auditoriums, centers and labs with appropriate technological assistance. Some of these classes are directed to develop student's logical, critical and analytical approach, use of Information Communication Technologies (ICT), drawing abilities, general worldview and preparing them to bachelor subjects. In general, main policy at FC is to benefit from ICT and thus restore gaps that Soviet education systems left us.

Within the framework of our partnership we build mutual contacts with European institutions and apply their teaching experience. In this direction we work with European Education Center INSE, Berlin (Germany), Lufthansa Training Center TRAINICO, (Germany), Aero-cosmic Center and ATR, Airbus center, Toulouse (France) Izmir Technological Institute, Anadolu University, Civil Aviation Institution, Baltic Aviation Academy and the like.

Similar direction with study process is practice of the theory learned. Practice is the essential part of the study practice in civil aviation. NAA sends its students to "AZAL" Azerbaijan Hava Yollari CSC to practice in aircrafts. However nowadays we started to organize summer schools abroad which include mainly practice in flight apparatus. The above mentioned course in Lufthansa training center was very helpful and important from this viewpoint. Our students applied what they had learned to the ATR, Airbus flight simulators. This summer we will organize summer courses at Baltic Aviation Academy for next practice and theoretical knowledge courses abroad. The practice shows that year after year more and more students are interested in these summer schools.

In order to develop importance of practice and use technology in the classroom NAA has built special Flight Training Center with modern simulators. It is an ideal step towards integration to European education system as the center is ready for competency not only in the region but also in Europe. We often invite foreign specialists and organize training for flight crew, technicians, and other staff together with future aviators-students. With modern Boeing, Airbus, ATR flight simulators of the center we step closer to ICAO and EASA standards in civil aviation study process. Practice in simulators is like digital game. The students sit at the cabin of the aircraft and the situation; circumstances occurred there is the same as in reality. It help student to find way out, to

solve problems, to manage the situation, land or take off the aircraft in various weather conditions and the like.

The center will develop not only civil aviation study in Azerbaijan, but also promote it in regional sphere and interest to this field will increase. Applied methodologies, and study materials and technologies keep aviation industry and hereby, transport system in general to develop. It will make easy our teachers, trainers and technicians to partake in international mobility programs after the experience gained according to new applied standards.

Fig. 4 and 5 *(Photos from Summer school training program at Lufthansa training center TRAINICO, Berlin (Germany))*

NEW TEACHING METHODOLOGIES AND INFORMATION AND COMMUNICATION TECHNOLOGIES APPLIED TO MICROECONOMICS

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ABSTRACT

In order to improve university teaching in the context of European Space for Higher Education and share our work with the university community we present the most innovative aspects of teaching that we are developing at the University of Valencia: interactive concept maps on each of the topics of a course in microeconomics, the development of multimedia teaching cross-content material (learning objects) of concrete concepts of microeconomic, the design of tools that promote teacher-student interaction and the development of webquests used by educators as a teaching resource aimed primarily at promoting both the students "work in group" and their self-taught.

INTRODUCTION

The process of adaptation to the European Space for Higher Education represents a fundamental change in the way of teaching but also in the role played by teachers and students in the course development. One of the objectives to be achieved is greater involvement and active participation of students in their learning process and it requires some change in the teacher's role who should become a guide in this process. For a succesful change, it is necessary to have tools that allow the orientation of students' self work. So that, these tools must accomplish the following goal: to clearly define the objectives of the course, the basic skills necessary to overcome the course and the work to be completed by the student.

Microinnova is an educational innovation group of teachers in the department of Economic Analysis at the University of Valencia, which has developed a series of digital educational materials related to the early stages of Microeconomics. Microinnova group is present on the Internet through its website (www.uv.es/microinnova) whith information of the group's objectives, links to educational materials developed and information of activities that may be of interest to students.

This work is being developed within the *Learning with Information and Communication Technologies project*, organized during 2009 by the University of Valencia in the framework of its Strategic Plan. On the one hand, *Learning with ICTs project* aims to promote the development of digital content and give continuity to the line of encouragement of ICTs in teaching. On the other hand, the group also has participated in the project *Open Course Ware (OCW)* that deals with the selection of teaching material to be deposited in a open repertoire at the University of Valencia' web (see http://www.uv.es/ocw).

As one of the objectives of Bologna is to promote the daily work by the student and backing it up with continuous assessment by the teacher, it is necessary to have material support: from theoretical content to study aids by means of exercises, case studies and self-assessment systems. In this respect, we have developed several tasks related to the development of digital teaching materials. The material is suitable for both courses in Introduction to Microeconomics and Intermediate Microeconomics. These materials are:

1) Interactive concept maps on each of the topics of a course in microeconomics. These maps can be used as an introduction to the contents of each issue, or provide an overview of the contents when its explanation in class has been completed or, also, as incomplete concept mapping for students to complete the missing information.

2) The development of multimedia teaching cross-content material (learning objects) of concrete concepts of microeconomic:

- Microeconomía I (http://ocw.uv.es/ciencias-sociales-y-juridicas/1-6/Course_listing)
- Microeconomía II (http://ocw.uv.es/ciencias-sociales-y-juridicas/2-1/Course_listing)
- Introducción a la Microeconomía (http://ocw.uv.es/ciencias-sociales-y-juridicas/4/Course_listing).

3) The design of tools that promote teacher-student interaction. We have started a blog (see http://micro-innova.blogspot.com/) in which we incorporate today's news that we think are interesting to students and offer them questions to help them make connections between the news media and the content of the theoretical explanations of the various topics which are taught in the subjects of intermediate microeconomics.

4) The development of webquests used by educators as a teaching resource aimed primarily at promoting both the students "work in group" and their self-taught.

THE CONCEPT MAPS

On the net different definitions of 'concept map' are found, all by itself valid. However, for its simplicity it is interesting the following: "Concept maps are tools for the simple and practical representation of knowledge, which can clearly convey complex conceptual messages and facilitate both learning and teaching. Its purpose is to represent relations between concepts. The concepts are included in boxes or circles, while the relations between them are explicated by lines connecting their respective boxes. The lines, in turn, have associated words that describe the nature of the relationship that links the concepts."

Microinnova group aims to exploit this tool at different levels. At one level, there has been designed a conceptual map as an introduction to the subject. At a second level, there has been designed an introductory concept map of each item. At a third level, the maps are more specific serving as a summary of each item. In a fourth level, we can use incomplete concept maps to be completed by the students.

The concept map relates all the topics covered in Microeconomics, so that the student looks how to relate all issues to be addressed since the first day of school. To achieve the objective, it was felt that without a good presentation, the student might lose track of the course, so there has been a synthesis effort to display the concept map as simple as possible at first glance. An example is shown below.

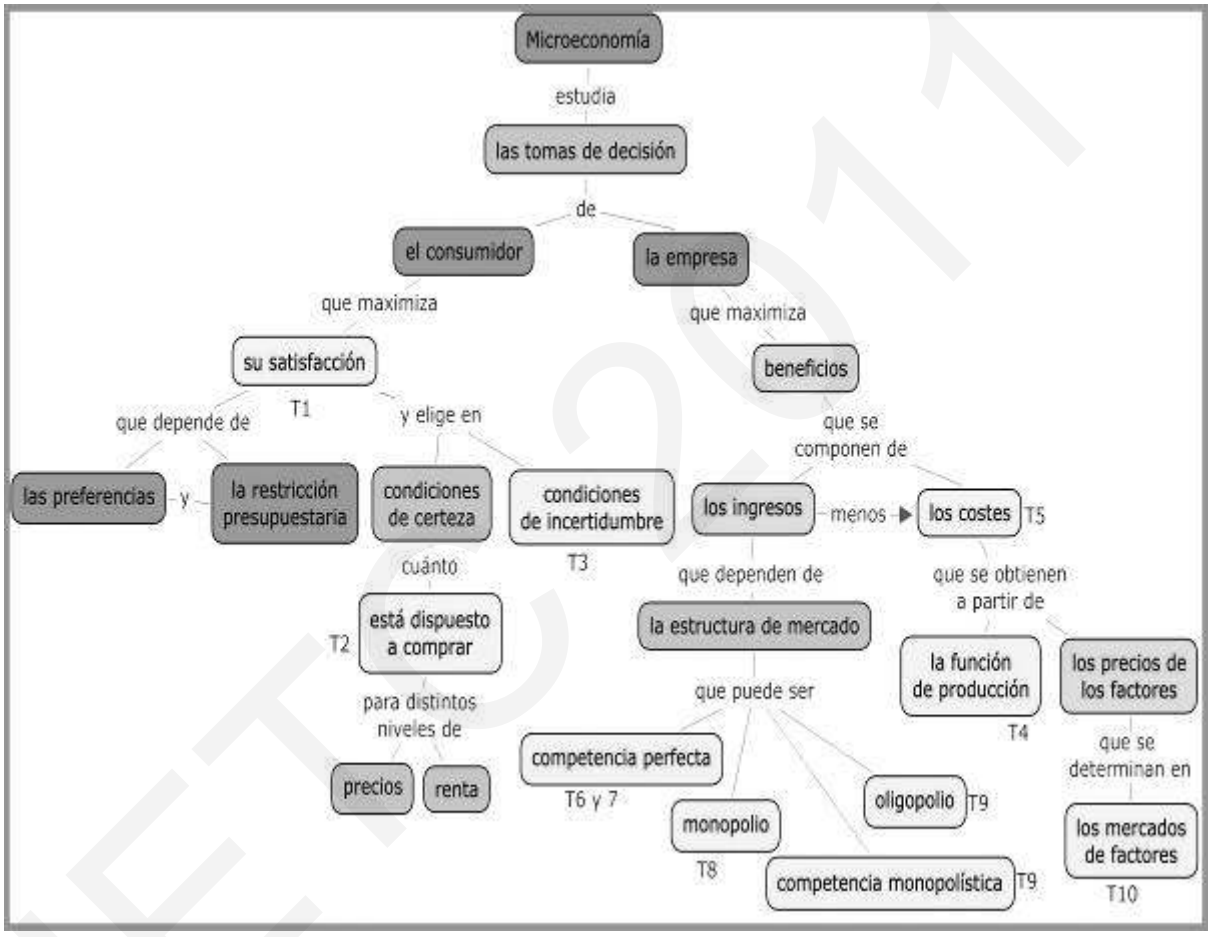
With the same idea as the concept map made for the introduction of the subject, other concept maps have been designed to serve as introduction to each of the topics. Thus, the student has a global vision of what is going to analyze and study in each subject, connecting the most relevant concepts. With a stroll through the concept map, the student will know the key concepts and how they are related. This predisposes them to better understand the objectives of the subject before attending class.

At third level operating, concept maps provide a summary of each topic. Having addressed the content of the topic, the students can clarify their ideas, highlight the most important aspects and display the common thread between the different concepts. These concept maps can have a considerable size, for that reason can be presented as separate linked concept maps.

In a fourth level, the student can evaluate to what extent has understood the subject with incomplete concept maps to be successfully completed. Some of concept maps will be very similar to those already

seen, but others may be totally different. For example, after selecting a number of concepts the student may be asked to draw a new concept map that relates these concepts. Thus, students bring their own understanding of the relationship between concepts.

This tool is an improvement in the teaching method while facilitating student self-learning process. The software used by Microinnova group for the realization of the maps is CMaps Tools program. In addition, concept maps are supplemented by theoretical schemes in PowerPoint format combining graphics with text explanations.



THE WEBQUEST

The webquest can be defined as a self-taught working tool in order to adress the student in the discussion and/or resolution, of a question or case study, preferably by obtaining information through the Internet. Webquest is an educational resource that has been highly successful since it allows the student to work independently although guided, step by step, by the teacher. Furthermore, it is primarily designed to foster teamwork so that students can be evaluated of their ability to work in teams, plus the ability to manage information using basic ICT tools and the ability to analyze information obtained. The analysis results are reflected in a report to be exposed in public

A webquest is prepared as a planned task in which the student presents the performance of a task through a series of steps. In this process, students must understand, analyze, synthesize and transform the information obtained, preferably using the Internet resources. Therefore, the webquest, made by the

teacher to guide the work to be performed by the student must contain a series of paragraphs that characterize and incorporate all the steps the student must follow in resolving the case, all the information they need to reach the objectives. The basic points of a webquest are the following:

The *Introduction* first explicitly states the goal or problem to be addressed and contextualized and explains its significance. In a second section called *Task* the work to be performed by the group is specified, describing the contents to be created and prepared for the report. It should also collect theoretical or empirical tools to be used during the task. A third section, called the *Process* indicates the student's next steps in the development of the task, ie, how to organize and plan the work. Forth, the webquest must include a list of *resources* to be used, places and documents where the information necessary for the production of work can be obtained. Fifth, the *conclusion* states what students should have learned in the course of their work. Finally, it is important that students know how to evaluate their work, and therefore, in a final section presents a table with headings that will be evaluated and the percentage of notes that each represents in the global rating.

The Microinnova group has developed several "webquest", related to the issue of non-competitive markets, government intervention, consumer subsidies and the concept of the production function. The developed issues belong to the content of the course, but real examples are used to adapt the contents to the real economic context. Therefore, related to the webquest of consumer subsidies, the information contained in the webquest adresses the students to web pages related to “aid for purchase”, “aid for rent houses in Spain”, “aid plan for the purchase of cars” or “aid for birth and schooling of children”. The main goal is for students to connect the theoretical concepts with reality and, at the same time, motivate research, review and discussion of the results within the group.

THE WEB PAGE AND THE BLOG FOR MICROECONOMICS

We have designed a website and a blog created to improve communication with the student and facilitate their access to digital materials produced by the group Microinnova. On the website are released the group's goals of educational innovation, innovation-related news and links from which to access the materials developed by the group in the deposit of teaching materials in open access at the University of Valencia (Open Course Ware (OCW)). Also, the website gives access to the Blog (see http://micro-innova.blogspot.com/) created to allow students access to a space in which to comment on current microeconomic issues.

The blog incorporates updated news regarding subjects related to Microeconomics. The news is discussed and students are invited to reflect and participate by offering questions to help them make connections between the news media and the content of the theoretical explanations of the various subjects taught at the intermediate microeconomics courses. Some of the news displayed in the blog is related to agreements between undertakings, interventionist measures or rulings of the “court of competition”. The idea is also to link this news repertory with the development of Webquest.

CONCLUSIONS

Adaptation of Microeconomics subjects to European Space for Higher Education makes necessary to have well-developed teaching materials that allow the teacher to perform his role of guide, mentor and motivator of student work. At the same time, these materials should be used to facilitate active and participatory role of students in their learning process. Microinnova group has developed a series of digital teaching materials for courses in basic and intermediate microeconomics. The tools presented in this paper have been the concept maps as an aid to the master class, the webquest as a way to encourage self-taught, though guided and a blog with updated economic information, with news and reviews tailored to the content of the course in which students can participate.

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ORGANIZATIONAL DEVELOPMENT INTERVENTION (ODI) ON THE MARKETING STRATEGIES FOR THE ASSESSMENT OF PROFITABILITY OF THE COURSE PROGRAMS WITHIN HIGHER LEARNING INSTITUTIONS

(A CASE STUDY OF THE CO-OPERATIVE COLLEGE OF KENYA)

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ABSTRACT

Over the time, the profitability of the course programs should be monitored and the corresponding Organization Development Intervention (ODI) on the marketing strategies should be assessed.

This study involved marketing strategy interventions on the course programs offered.The results of the study showed significant improvements in the obtained t-values. Marketing strategies on Course program operation improved with an average obtained t-value of 5.81. Marketing strategies on Leadership improved with an average obtained t-value of 5.91. Marketing strategies on Work Environment had an average t-value of 5.56. Marketing strategies on Team Work obtained an average of a t-value of 5.68. Marketing strategies on Management obtained an average of a t-value of 5.12. Marketing strategies on staff motivation obtained an average of a t-value of 6.10

The ODI helped the College to improve on its marketing strategies which assisted in the improvement of the profitability levels of the course programs.

INTRODUCTION

Many higher learning institutions in the world are continuously introducing course programs in the market for various potential students. The profitability of such course programs should be evaluated over time. The College is the only recognized training institution in the country for the co-operative movement staff, the committee members, the ministry staff, and individual members as well as potential informal economy groups having intention to form co-operatives in order to reduce poverty nationally and internationally. The profit levels of most of the College courses offered in the past had shown decline in profits as shown in the table below:

COURSE PROGRAM	2004/2005	2005/2006	2006/2007
Certificate in Co-operative Banking and Diploma in Co-operative Banking.	701,771	577,897	405,096
Co-operative Business Administration, Certificate in Co-operative Administration and Diploma in service Movement.	2,643,040	3,382,213	2,874,725
Diploma Pre-service year I, II&III	-110,935	1,531,857	7,218685
Bachelor of Co-operative Business Degree	1,120,012	-200,320	3,488,169
Agri-Business Co-operative Training Center.	1,120,012	853,738	120,673

Source: COCK Income and expenditure Accounts for 3 financial years

The purpose of this study was to introduce organizational intervention marketing strategies to assist in improving the profitability levels of the course programs.

METHODS AND PROCEDURES

The study used two methods. The first was assessment and evaluation of the course programs profitability levels, and marketing strategies on the course programs. The second was descriptive comparative method to determine the prevailing state of marketing strategies and the impact of the same after the ODI on the profitability of the College Course programs. To determine profitability levels, record of income and expenditure from the financial year 2004/2005 to 2006/2007 were used. The second instrument used was the Perception Questionnaire by Ernest Schuttenberg (2003), which was modified to suit the purpose of the research.

Before the intervention activities, the College Academic staff met and discussed issues pertaining to the review of the strategic plan where marketing strategies were to be incorporated. This formed the basis upon which the various intervention marketing strategies were to be implemented. The data collected through the questionnaire formed

the pre-intervention baseline facts. After the approval of the intervention activities through the College Strategic Plan, the intervention activities started.
The data obtained from the pre intervention and the post intervention surveys were statistically treated using the means. The t-test at 0.05 levels was applied on the two correlated means to determine the significant difference of the pre and post organization development intervention activities.

RESULTS

The results of the study showed significant improvements in the obtained t-values. Marketing strategies on Course program operation improved with an average obtained t-value of 5.81 as shown below:

MARKETING STRATEGY ISSUES	t- VALUE	CRITICAL VALUE	SIGNIFICANCE
1. The degree to which the Co-operative College of Kenya produce high quality-programs.	**5.98**	**2.0**	Significant
2. The degree to which Co-operative College of Kenya is concerned with solving marketing strategy problems concerning course programs.	**6.54**	**2.0**	Significant
3.The degree to which the College programs are useful to the Co-operative Movement and the associative economy	**5.78**	**2.0**	Significant
4.The degree to which the College is successful in accomplishing its goals on marketing strategies.	**5.98**	**2.0**	Significant
5. The degree to which the College commits money, time, and knowledge to solution of marketing problems.	**4.89**	**2.0**	Significant
6. The degree to which the College course programs are up to date	**3.65**	**2.0**	Significant
7. The degree to which leadership on marketing strategies for the College course programs is provided by the management.	**7.84**	**2.0**	Significant
TOTAL OVERALL MEAN	**5.81**	**2.0**	Significant

Marketing strategies on Leadership improved with an average obtained t-value of 5.91 as shown below:

MARKETING STRATEGY ISSUES	t- VALUE	Critical Value	SIGNIFICANCE
1. The degree to which Co-operative College of Kenya will give staff the opportunity to do and to learn to do all the things they consider themselves capable of to improve course programs.	**4.78**	**2.0**	**Significant**
2. The degree to which the most knowledgeable people are consulted in making marketing strategy decisions in the College.	**7.03**	**2.0**	**Significant**
3. The degree to which staff feel free to risk making mistakes in doing their job related to marketing strategies for the College course programs.	**6.91**	**2.0**	**Significant**
4. The degree to which those in positions of authority are concerned to hear how staff feel the College is being run-both pro and con.	**4.82**	**2.0**	**Significant**
5. The degree to which management correctly interprets the impact of College Marketing strategies and trends within the College	**4.56**	**2.0**	**Significant**
6. The degree to which staff feel free to discuss College marketing problems and dissatisfaction with those in the organization who can do something about the marketing problems.	**5.92**	**2.0**	**Significant**
7. The degree to which those in positions of authority are responsive to staff suggestions and wishes about the marketing strategies within the college	**7.86**	**2.0**	**Significant**
8. The degree to which the College is strong in long range Marketing planning.	**5.39**	**2.0**	**Significant**
TOTAL OVERALL MEAN	**5.91**	**2.0**	**Significant**

Marketing strategies on Work Environment had an average t-value of 5.56 shown below:

MARKETING STRATEGY ISSUES	t- VALUE	CRITICAL VALUE	SIGNIFICANCE
1. The degree to which the College changes its way of marketing the course programs as new conditions and needs arise.	**7.23**	**2.0**	Significant
2. The degree to which the management keeps abreast of outside developments affecting the College.	**7.54**	**2.0**	Significant
3. The degree to which reactions of clients or others on the outside cause changes to be made at the Co-operative College of Kenya.	**4.87**	**2.0**	Significant
4. The degree to which the College is quick to change the marketing strategies when change is needed.	**5.83**	**2.0**	Significant
5. The degree to which the College is aware of new discoveries and methods of delivering its services	**3.98**	**2.0**	Significant

6. The degree to which the College is effective in foreseeing potential problems in the accomplishment of Marketing objectives	**4.82**	**2.0**	Significant
7. The degree to which the College Course programs have earned a good reputation.	**4.96**	**2.0**	Significant
8. The degree to which the College is directly involved in alleviating problems in the society in addition to offering primary course programs.	**5.23**	**2.0**	Significant
TOTAL OVERALL MEAN	**5.56**	**2.0**	Significant

Marketing strategies on Team Work obtained an average of a t-value of 5.68 as shown below:

MARKETING STRATEGY ISSUES	**t- VALUE**	**CRITICAL VALUE**	**SIGNIFICANCE**
1. The degree to which the various departments and work groups that make up the College work together co-operatively on marketing strategies to get the job done.	**5.96**	**2.0**	Significant
2. The degree to which staff are involved in the making of Marketing strategy plans and decisions within the College	**6.43**	**2.0**	Significant
3. The degree to which people at various levels within the College participate in Marketing planning and decision-making activities	**4.78**	**2.0**	Significant
4. The degree to which group decision-making on Marketing Strategies is practiced within the College.	**5.54**	**2.0**	Significant
TOTAL OVERALL MEAN	**5.68**	**2.0**	Significant

Marketing strategies on Management obtained an average of a t-value of 5.12 as indicated below:

KEY FACTORS ON MARKETING STRATEGIES	**t- VALUE**	**CRITICAL VALUE**	**SIGNIFIC ANCE**
1. The degree to which the College management stresses its responsibility to the Co-operative movement and the associative economy at large.	**5.34**	**2.0**	Significant
2. The degree to which staff are kept informed about the things staff need to know concerning College Marketing strategies.	**6.17**	**2.0**	Significant
3. The degree to which staff understand the goals of the College.	**4.98**	**2.0**	Significant
4. The degree to which the management is concerned to know how those outside the College view its effectiveness in delivering appropriate course programs	**5.72**	**2.0**	Significant
5. The degree to which management is concerned about how staff at the College feel about the marketing strategies and what they think should be done on the marketing strategies.	**3.93**	**2.0**	Significant
6. The degree to which management is tolerant of people trying out new marketing strategies even though they may be unsuccessful.	**5.04**	**2.0**	Significant
7. The degree to which the upward communication about marketing strategies for College course programs flow within the college without obstruction.	**4.65**	**2.0**	Significant
TOTAL OVERALL MEAN	**5.12**	**2.0**	Significant

Marketing strategies on staff motivation obtained an average of a t-value of 6.10 as show below:

MARKETING STRATEGY ISSUES	**t- VALUE**	**CRITICAL VALUE**	**SIGNIFIC ANCE**
1. The degree to which staff get personal satisfaction to the work staff do at the Co-operative College of Kenya.	**6.97**	**2.0**	Significant
2. The degree to which staff feel free to suggest new ways of undertaking marketing strategies for the College programs	**5.76**	**2.0**	Significant
3. The degree to which staff personal goals and aspirations are taken into account in management decisions.	**4.87**	**2.0**	Significant
4. The degree to which it is advantageous to staff in the College to stick their neck out and take risks in doing their job	**4.95**	**2.0**	Significant
5. The degree to which ideas and desires of members of staff within the College influence changes that are made on marketing strategies.	**6.46**	**2.0**	Significant
6. The degree to which staff have the opportunity to use all their abilities in their job to market College course programs.	**7.56**	**2.0**	Significant
TOTAL	**6.10**	**2.0**	Significant

Summary of the Comparison Analysis of Marketing Strategies profiles before and after Intervention at Critical value=2.0 at 0.05

MARKETING STRATEGY ISSUES	**MEAN BEFORE INTERVENTION**	**MEAN AFTER INTERVENTION**	**OBTAINED t-values**	**SIGNIFICANCE**
Course Program operations	1.62	3.86	5.81	Significant
Leadership	2.19	3.58	5.91	Significant
Work Environment	2.04	3.63	5.56	Significant
Team Work	1.82	3.62	5.68	Significant
Management	1.81	3.82	5.12	Significant
Staff Motivation	1.73	3.31	6.10	Significant
TOTAL AVERAGE MEAN	1.87	3.64	6.00	Significant

CONCLUSION

The ODI therefore helped the Co-operative College of Kenya to improve on its marketing strategies which assisted in the improvement of the profitability levels of the College course programs.

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ADOPTION PROCESS OF INSTRUCTORS TO ONLINE ROLES

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ABSTACT

The emergence of increasingly online learning activities in the 1990s, facilitated by new instructional technology introduced in the 2000s, is contributing to a dramatic evolution in instructors' online roles, and raises fundamental questions about how instructors will adopt these changing roles for their teaching-learning activities. At this study adoption process of instructors' online roles was investigated deeply using ethnographic case study methodology. Sample of study is 3 instructors at Educational Administration, Controlling, Planning and Economics non-thesis master's program. Researcher joined online teaching learning activities as student with new identity and collected data using ethnographic approaches. Data about adoption process were collected focusing 4 main online roles of instructor which are pedagogical technical, social and managerial. Results of study offers deep information about instructors' adoption process to online learning environment

Keywords: instructors' online roles, ethnographic study, adoption process to online roles

INTRODUCTION

The emergence of increasingly online learning activities in the 1990s, facilitated by new instructional technology introduced in the 2000s, is contributing to a dramatic evolution in instructors' roles, and raises fundamental questions about how instructors will adopt these changing roles for their teaching-learning activities.

Online learning has been a highly desired method for learning among adults due to the time and space convenience that it offers compared to that of face-to-face learning. For this same reason, online learning has become widely used in higher education (Debuclet, 2008). Although online learning has become a widely used form of providing and receiving education, its effectiveness continues to be questioned (Jorgensen, 2002). Many online courses are designed based on the traditional knowledge acquisition model and conducted no differently than traditional classes (Lou, 2004; Ying, Fuzong and Xue, 2003).

The role of the online instructor has transitioned from sage-on-the-stage to that of a facilitator. There are many definitions of the changing role of instructors in online learning. Although learning is more student-centered and the instructor is seen as a facilitator, all the definitions focus on the importance of the role in students' learning experience. The instructor is not simply a moderator, but one who purposely designs instruction and guides students through social and cognitive engagement. Though not at the center of the learning process, the instructor plays a vital role in online learning (Anderson, Rourke, Garrison and Archer, 2001; Berge, 1995; Mason, 1991; Paulsen, 1995).

Regardless of the type of distance learning program an institution employs in higher education, if the distance learner is to succeed, instructors must do more than provide access to information (Vonderwell and Sawery, 2004). They need to truly understand the learner's needs and design learning environments that facilitate learning, environments that enhance access to and success in higher education. The success of online learning depends on the instructors' ability to acquire new competencies, rather than mastering the technology.

In spite of the debate among faculty, students and administrators about the effectiveness of distance learning, distance learning is a phenomenon that is here to stay and this debate is likely to continue for quite some time. With regard to the effectiveness of distance learning programs, many researchers have pointed out that the instructor is the key element to the success of a distance learner. However, despite the growth in online instructor competency-related studies, almost none of the competencies identified, took into consideration the distance learning students' perspective. The majority of these competencies were identified by experts in the field (Abdulla, 2006). The success of an online learning program requires effective techniques and strategies about which instructors to be knowledgeable. The findings of this study will help the online instructors make informed decisions in

order to facilitate distance learning activities. This study will also help administrators in higher education institutions make informed training decisions when implementing distance learning programs.

Instructors' Online Roles

To investigate adoption process of instructors to online roles, Berge's instructors' roles - pedagogical, managerial, social, and technical - have been used (Berge 1995, 1996).

Pedagogical: The pedagogical role encompasses everything done to support the learning process of individual students or working groups. Based on the application of Vygotsky's sociocultural theory to an online course for pre-service teachers. Bonk et al. (1999) provide a breakdown of ways instructors can use instruction and facilitation during online discussions. The following role behaviors fall clearly into the dimension of pedagogical functions: direct instruction; direct questioning; providing modeling or examples; giving advice or suggestions; fostering student reflection or self-awareness; pushing students to explore other sources of information; prompting students to explain or elaborate on their ideas; providing feedback or praise; cognitive task structuring; 'weaving' students' contributions into a single summary in order to capture and re-focus students on the essence of ongoing or completed discussions (Harasim et al., 1995).

Managerial: The managerial role refers to activities designed to make the course run smoothly at an administrative level. Managerial roles include the organizational, procedural, and administrative tasks associated with the learning environment (Berge, 1995).

Social: The social function is typically employed to promote a friendly environment and community feelings to support student cognitive learning processes. Such social functions include developing harmony, group cohesiveness, and collective identity (Bonk, 2001).

Technical: The technical role involves choosing appropriate software to meet specific learning goals, and assisting students to become competent and comfortable users of the chosen software.

The purpose of this research was to examine the most important factors affecting adoption process to four dimensions of online instructor roles in a rapidly-expanding online MBA program. This study will focus on the following research questions:

1- What are instructors' perceptions of their roles when teaching online in terms of Berge's (Berge, 1995) classifications?

2- What are factors affecting adoption process of four dimensions of instructor roles?

METHODOLOGY

The purpose of this study was to investigate adoption process of instructor roles and the complex issues involved in a distance learning environment. The ethnographic case study approach for such exploratory research is useful for better understanding a complex system (Stake, 1994).

The central core of ethnography is a concern with the meaning of actions and events to the people the researcher is trying to understand; it always implies an understanding of culture. All of us learn about culture by observing other people, listening to them, and then making inferences. In developing case studies using the ethnographic research approach, inferences are made from three sources: 1) from what people say; 2) from the way people act; and 3) from the artifacts people use (Spradley, 1979).

Research Group

Sample of study is 3 instructors at Educational Administration, Controlling, Planning and Economy Non-Thesis Master's Program in Karadeniz Technical University in Turkey. Data collected using observation forms and semi conducted interviews made with 3 instructor. Study was conducted at 3 steps.

First Step: Observing Instructors during online program.

Researcher joined online program as student with a new identity .Researcher was participant observer, an active member of the online program. Researcher observed instructor's activities based on four main online role of instructor using observation forms. Ethnographic case study was centered on technical, managerial, social and pedagogical roles of instructor at online learning system. Researcher observed instructors during 14 weeks in live classes and asynchronous learning activities. Researcher impacted online learning to reveal and observe instructor's roles. All of live classed were video recorded. Another data resource is instructor's asynchronous activities during education. Researcher was also analyzed video document and asynchronous activities to collect data.

Second Step: Data Collection through Interviews

One interview lasting around 45 minutes was conducted with each instructor at the end of online program. Interviews were focused on perceptions of instructors to their online roles and factors affecting their adoption process to their online roles.

Third Step: Analysis and Writing

Instructor specified their roles and adoption process from their own point of view. Analysis was made to interpret what was said and what was observed. Major categories were emerged from analyzing the data.

Researcher needed to ensure that data collected from observations, video documents and interviews has a valid reflection on instructor's adoption process to online roles and determine whether the conclusions drawn are generalisable or not. Therefore similar to most researchers (Şahin, 2005; Nesrin 2003) in the qualitative paradigm, the researcher used triangulation, which in simple terms suggests that the researcher used multiple methods to collect the relevant data. According to Merriam, the opportunity to use multiple methods of data collection is a major strength of a case study research (Merriam, 1961). Methodological triangulation combines dissimilar methods to study same topic so that the flaws of one method are used as the strength of another. In this study, the researcher used observations, interviews and video documents to collect data.

FINDINGS

Data from the interviews, observations and document analysis were combined to describe how the instructors perceived and adopt their roles in the online learning environment

Researched made observations focusing on 4 main roles of instructors. Researcher observed activities, responsibilities and subroles of instructor at each main role.

Adoption Process and Perception of Instructors to Online Pedagogical Roles

Adoption process to pedagogical roles was analyzed at four main perspectives, course designer, profession–inspirer, feedback giver, interaction facilitator.

Table 1. Analyses of instructors' pedagogical online roles from three dimensions.

Pedagogical Roles		Data Collected From Observations	Data Collected From Video Documents And Asynchronous Activities	Data Collected From Interviews
Course designer	I-1	I-1 has problems designing interactive learning elements,	I-1 could not design course materials, all time use same materials.	I-1 claims that he has enough skills for designing course.
	I-2	I-2 has problems designing interactive learning elements, does not want to share experiences with colleagues	I-2 need help designing online courses; just use same type of material.	I-2 claims that he is insufficient as course designer.
	I-3	I-3 has problems designing interactive learning elements,	I-2 need help designing online courses.	I-1 claims that he has enough skills for designing course.
Profession-inspirer	I-1	I-1 can not promote professional dialogue among online learners	I-1 can not promote professional dialogue among online learners	I-1 claim he is enough promoting dialogues.
	I-2	1-2 can promote professional dialogue among online learners	I-2 can organize dialogues at asynchronous part of online system	I-2 claim he is enough promoting dialogues.
	I-3	I-3 can not promote professional dialogue among online learners	I-3 can not promote professional dialogue among online learners	I-3 claims that he is insufficient as profession-inspirer.
Feedback-giver	I-1	I-1 can provide timely and high quality feedback	I-1 can provide timely and high quality feedback	I-1 claims that he can provide feedback.
	I-2	I-2 can not provide timely and high quality feedback	I-2 can not provide timely and high quality feedback	I-2 claims that he can provide feedback.
	I-3	I-3 provides timely and high quality feedback; provide formative feedback for continuous learning engagement	I-3 can provide timely and high quality feedback	I-1 claims that he can provide feedback.
Interaction facilitator	I-1	I-1 can facilitate peer interaction during live classes.	I-1 can facilitate peer interaction during live classes, can not provide interaction at asynchronous discussions	I-1 claims that he can provide peer interaction among students.
	I-2	I-2 can not facilitate peer interaction enough during live classes.	I-2 can not facilitate peer interaction enough during live classes and did not use asynchronous discussions.	I-2 claims that he has problems facilitating peer interaction
	I-3	I-3 can facilitate peer interaction during live classes.	I-3 can facilitate peer interaction during live classes, can provide interaction at asynchronous discussions	I-3 claims that he can provide peer interaction among students.

Table 1 shows analyses of instructors' pedagogical roles from three dimensions; observations, document analyses and interviews. Results of table 1 show that instructors could not complete their

adoption process to their pedagogical roles. There are some differences at instructor's views and observations. Although instructors claim that they are enough at some pedagogical roles, observation results and document analyses show that they could not accomplish their online pedagogical roles. Factors affecting to instructors' adoption process to pedagogical roles were shown at Table 2.

Table 2. Factors affecting instructors' adoption process to online pedagogical roles

		Lack of Technical Capacity	Affection of using Previous pedagogical experiences	Control of learning environment	Negative attitudes
Interviews	I-1	X	X	X	X
	I-2		X		
	I-3				X
Observations	I-1		X	X	
	I-2	X	X	X	
	I-3	X		X	
Document analyses	I-1		X	X	
	I-2	X			
	I-3	X		X	X

Instructor coded I-1 said that " I have problems controlling classroom, and could not decide to chose teaching methods and materials." Observation and document analyses results also show that instructor coded I-1 has problems to accomplish online pedagogical roles.
Instructor coded I-2 said that "It was fist time that I am an instructor at online learning program. I tried to use my previous experiences and methods for my teaching. I could not design and use new methodologies for online learning." Observations and document analyses results also show that instructor coded I-2 has lack of technical capacity problems for controlling learning environment and try to use previous teaching experiences for online teaching. Instructor coded I-3 has negative attitudes to online learning. Main reasons of his attitudes are his lack of technical capacity, controlling learning environment and not to choose appropriate teaching and methods for online teaching. Instructors have problems completing their pedagogical roles and four main affect; lack of technical capacity, trend of using previous pedagogical experiences, controlling classrooms and negative attitudes.

Adoption process and perception of instructors to online managerial roles

Adoption process to managerial roles was analyzed at two main perspectives; conference manager and organizer and planner

Table 3. Analyses of instructors' Managerial online roles from three dimensions.

Managerial Roles		Data Collected From Observations	Data Collected From Video Documents And Asynchronous Activities	Data Collected From Interviews
Conference manager	I-1	I-1 could not ensure equity in online discussion; provide ,similar students joined to discussions	I-1 could not has ensured equity in online discussion; provide ,similar students joined to discussions, instructor ensured equity in asynchronous activities	I-1 claims that he ensured equity at online learning and he has enough skills for conference manager role.
	I-2	I-1 could ensure equity in online discussion; provide ,similar students joined to discussions and promote knowledge construction	I-1 could ensure equity in online discussion; provide ,similar students joined to discussions and promote knowledge construction	I-2 claims that he is sufficient four conference management.
	I-3	I-3 could not ensure equity in online discussion; provide ,similar students joined to discussions	I-3 could not has ensured equity in online discussion; provide ,similar students joined to discussions, instructor ensured equity in asynchronous activities	I-1 claims that he has enough skills for conference manager role.
Organizer and planner	I-1	I-1 provided clear instructions and organization of course structure at some classes, I-1 could not achieve a balance between structure and flexibility	I-1 provided clear instructions and organization of course structure at some classes, could not provide a clear instruction and organization at asynchronous activities	I-1 claim he is enough organizing instructions and course.
	I-2	I-2 tried to organize instructions and courses using old experiences, have problems composing balance between time, structure and flexibility	I-2 provided clear instructions and organization of course structure at some classes, could not provide a clear instruction and organization at asynchronous activities	I-2 claim he has problems organizing instructions and course especially at asynchronous activities
	I-3	I-3 provided clear instructions and organization of course structure at some classes, I-1 could not achieve a balance between structure and flexibility	I-3 provided clear instructions and organization of course structure at some classes, could not provide a clear instruction and organization at asynchronous activities	I-3 claim he is enough for his organizer and planner role.

Managerial roles include the organizational, procedural, and administrative tasks associated with the Learning environment (Berge, 1995). Instructors have two main managerial role; conference manager and organizer and planner. Results of Table 3- show that instructors have problems managing the online teaching and learning activities. Main problem of instructors was to manage discussions at live classes. They have spent a lot of time for discussions and have problems to complete schedule in time. Another problem was at asynchronous discussions some students take control of the asynchronous discussions and instructors could not control asynchronous discussions.

At interviews instructor noted that online learners need to be provided with a clear structure and timeline to keep them engaged in learning their busy work schedules. Instructor coded I-2 commented that; "At first course I introduces to timeline to students, But following weeks I have problems following up weekly activities. I could not control time of synchronous discussions. I have to transfer some discussions to asynchronous part of online system."

Instructor could not compose flexibility and tried to apply timeline in time. Students get problems completing their assignment in time.

Adoption process and perception of instructors to online social roles

Table 4. Analyses of instructors' social online roles from three dimensions.

Social Roles		Data Collected From Observations	Data Collected From Video Documents And Asynchronous Activities	Data Collected From Interviews
Social rapport builder	I-1	I-1 tried to build social rapport; encourage students joining discussions	I-1 tried to build social rapport, encouraged students being part of online learning community	I-1 claims that he has problems accomplishing his social roles due to insufficient abilities of online learning system.
	I-2	I-2 tried to be part of online learning community, encourage students to discuss and being together at different online systems	I-2 tried to build social rapport, encouraged students being part of online learning community, especially encouraged students to be active at asynchronous activities	I-2 claims that he is sufficient four his social role.
	I-3	I-3 have problems building social rapport, could not communicate students enough, could not compose interaction among students	I-3 have problems building social rapport, could not communicate students enough, could not compose interaction among students	I-3 claims that he is insufficient four his social role.

Instructors have problems being part of online learning community. Instructor coded I-1 said that "This was first time I was a part of online learning, I have a lot negative attitudes before to online courses, but following weeks I have adopted to online environment and encourage students being active at online system.

Instructors noted that ability to build a more personal relationship between educator and student was their biggest challenge for online learning. Instructor coded I-3 said that "Online learning is impersonal environment. I could not develop rapport with students, because I can not see interaction between students. That was my biggest problem in online environment. "

In summary, the instructors had approximately same feelings regarding the importance of the social role in this online MBA program. Also results of observations and documents analyses show that instructors had tried to compose online learning community. In general, these instructors were not yet convinced of the relevance and viability of the social role for student learning. Various technological limitations, negative attitudes about distance education and concerns about time affected their efforts building online learning community.

Adoption process and perception of instructors to online technical roles

Adoption process to technical roles was analyzed at three main perspectives; technical coordinator, media designer and technology integrator.

Table 5. Analyses of instructors' technical online roles from three dimensions.

Technical Roles		Data Collected From Observations	Data Collected From Video Documents And Asynchronous Activities	Data Collected From Interviews
Technical coordinator	I-1	I-I tried to help students for technical problems, but his lack of technical ability he could not refer enough support.	I-I tried to help students for technical problems, but his lack of technical ability he could not refer enough support, discussed students about their technical problems at asynchronous activities	I-1 claims that his lack of technical capacity blocked his efforts to refer technical support to students.
	I-2	I-2 could not refer enough help to students, when students get problems he directed them online system staff.	I-2 could not refer enough help to students for their technical problems.	I-2 claims that he is insufficient for technical coordinator
	I-3	I-3 was willingly to help students for their technical problems but his lack of technical knowledge blocked his efforts, he just directed to students to online system staff.	I-3 could not has ensured equity in online discussion; provide ,similar students joined to discussions, instructor ensured equity in asynchronous activities	I-1 claims that he has he is willingness but insufficient for technical coordinator
Media designer	I-1	I-1 could not develop rich multi media tools, just use presentation and texts for his courses, did not demand extra tools from online system staff.	I-1 just use presentations and texts, used asynchronous parts of online systems only for discussions, did not use any other elements of online system	I-1 claim he is insufficient as media designer.
	I-2	I-2 used presentations and texts documents, used video for two classes, did not demand extra tools from online system staff.	I-2 just use presentations and texts, used asynchronous parts of online systems only for discussions, did not use any other elements of online system	I-2 claim he has some deficiencies but generally he is sufficient for media designer.
	I-3	I-3 used presentations ,texts documents and used survey tool, did not demand extra tools from online system staff.	I-2 just use presentations and texts, used asynchronous parts of online systems only for discussions, did not use any other elements of online system	I-3 claim he is enough for media designer role.
Technology integrator	I-1	I-1 did not use chat rooms, web conferencing and audio conferencing in live classes effectively, was unwillingness to use new technologies	I-1 did not use discussion forums effectively, was unwillingness to use new technologies	I-1 claim that he could not use new technologies effectively lack of his technical ability
	I-2	I-2 tried to organize chat rooms and discussions, was willingness to use new technologies, used web conferencing at some classes.	I-2 tried to organize asynchronous activities at discussion forums	I-2 claim that his technology integrator role is related with his technology usage level.
	I-3	I-3 used just minimum part of online system out of surveys, was willingness to use new technologies,	I-3 did not use functions of asynchronous activities effectively.	I-3 claim he is not enough for his technology integrator role.

Table 5 shows findings about instructor's technical roles. Instructors noted that their biggest problems at online learning were technical. Instructor coded I-3 said that " My insufficiencies for my technical roles affected to accomplish and adopt my other online roles". Instructors tried to use online chat rooms in live classes. But they have problems controlling online chat activities. Instructor coded I-2 said that "It was frustrating not to be able to control chat activities and time consume during chat activities".

Although instructors know functions of online system, they just use limited parts of online system. They were unwillingness to use online system tools. Instructor coded I-1 noted that "I know that system has a lot of tool to prepare an effective lesson, but I was hesitating to use these Technologies because of my lack of technical capacity."

Summary, new technologies increased efforts to include highly interactive pedagogical tools. However, the overall level of technology use was still relatively low. Presentations, asynchronous discussion forums, chat rooms were the most frequently employed tools, whereas more sophisticated interactive tools video, web conferencing, audio& video conferencing, email and survey tool, were in relatively low use.

DISCUSSIONS AND CONCLUSION

The findings clarified instructor's adoption process and perception of instructor to online roles. Instructors performed different roles at different degrees. Instructor's online roles were investigated from three aspects, observations, interviews and document analyses and asynchronous activities. One important point at this study, there were different findings at the view of these three aspects. Main reason for this situation was perception of instructors to their roles. This was first online learning experiences of instructors. Although they could not perform their role adequately, they claim that they are sufficient and performed well their online roles.

Instructors most strongly emphasize the pedagogical roles. Results of observations and document analyses show that although instructors emphasize pedagogical roles mostly, they have big problems for accomplishing and adopting their roles. This finding is consistent with similar with literature. Rohfeld and Hiemstra (1995), in their study commented that online instructors have biggest problems although they give more importance to pedagogical roles.

The degree of facilitating online discussion of online instructors was different from each other. This study revealed that the factors affecting facilitating online discussions. Timing, perception of instructors, moderating skills, technical capacity of instructors was main factors affecting degree of facilitating online discussions. These results are similar with Liu 's (2005) study. Liu stated that timing, course type, perceptions, and moderating skills are important factors for online discussions and show variations among instructor.

Also consistent with the literature is the finding that effect of previous experiences on instructors' adoption process is an important factor. Salmon and Giles (1997) noted that online learning is different from traditional learning, if novice online teachers are insistent to use previous experiences they get problems to build online learning.

The need for flexibility at managerial roles has also been supported in other literature. For example, Rohfeld and Hiemstra (1995) have argued that learners who have a high level of control over their learning activities are encouraged to take greater responsibility for their learning.

The findings related to instructors' perceptions and adoption of the social roles were highly similar to the Bawane and Spector's (2009) study. Bawane and Spector noted that effective online teaching is adapting to student needs, communicating effectively, and showing concern for building social rapport.

Differently form other studies (Lui, 2005; Anderson, 2001; Teles, 2001) instructor's online technical roles present significant challenges to online instructors.

On the whole, the study and results imply that factors affecting instructor's adoption process and perceptions of instructors must be evaluated for designing effective online learning and composing online learning community. Lack of technical ability has influence on pedagogical, managerial and social roles of instructor. Being inexperienced for online learning affected to development of instructor's online role about designing, controlling and managing learning environment.

Finally, the findings in our study confirmed that instructor's effective usage of online learning environment is related how and more instructors adopt online roles. Instructors know that if they accomplish their roles successfully, they will provide satisfactory experience for online learners.

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PERCEIVED SAFETY CULTURE IN ELECTRICAL AND ELECTRONIC ENGINEERING DEPARTMENTS AT UNIVERSITIES

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ABSTRACT
The objective of this study focuses on the interactions between organizational and individual factors that affect group safety culture. The empirical data come from a simple random sample survey of 373 teachers in electrical and electronic engineering departments at 70 universities in Taiwan. An exploratory factor analysis and a confirmatory factor analysis were employed to examine the safety culture scale. The model is acceptable after slight modification, producing a reliable and valid scale for measuring safety culture. A two-way MANOVA indicates interaction effects on safety culture between (a) the presence of a full-time safety manager and the type of laboratory; and (b) the presence of a safety committee and the age, gender and academic rank of faculty members. Therefore, differences in perceptions of safety culture among university faculty vary according to institutional factors at their university. As a contribution to the development of a positive safety culture, the authors make some recommendations for improvement at universities without safety managers or safety committees.
Keywords: safety culture, organizational factors, individual factors, interaction effects.

INTRODUCTION

Background

University laboratories are a means of developing a student's ability to perform experiments, to work as a team, to communicate effectively, to learn from failure and to take responsibility for one's own actions (Krivickas & Krivickas, 2007). However, the modern university laboratory environment is dangerous, with chemical, biological and radiological hazards (Modica, 2007). In 2005, there were almost 10,000 accidents in laboratories in the USA, or 2 accidents per 100 laboratory researchers (Coghlan, 2008). Between 1997 and 2004, there were 21 research laboratory accidents in Taiwan which resulted in the injury or death of students or instructors (Wu, 2008). In electrical and electronic engineering laboratories and other such departments, there is teaching and research on photoelectricity, semiconductors and nanotechnology processes, as well as instruction and research into traditional electric power systems, control systems and computer systems. Hazards in these laboratories may include mechanical, chemical, biological (or infection), ergonomic, and social-psychological; these hazards are worthy of more research.

These risks and hazards can be controlled by safety engineering and safety management. In safety management, safety culture is the key factor for maintaining laboratory safety. A laboratory's safety culture must support and encourage employees to report events which have caused danger or potential risks, and ensure that the safety of all people working the laboratory is guaranteed (Modica, 2007). A survey of safety culture perception offers the laboratory manager a frame of reference. Not only can it help to ensure the health and safety of the employees, it also enables scientific research and education to be conducted more smoothly.

Factors affecting safety culture

After the Chernobyl disaster, the International Atomic Energy Agency (IAEA) gave the following definition: "*Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance*"(IAEA, 1991). This definition implies that the value an organization places on safety culture is affected by organizational and individual factors. This feature is reminiscent of social system theory. A social system is composed of two levels, which are theoretically separate but which in practice are highly interrelated. One level is the expectations that an organization has towards its own component sections, given the overall aim of realizing the group goals. The other

level is the needs of the individual and his or her unique character. The organization interacts with individuals to produce what is known as social behavior (Ornstein & Hunkins, 1993).
Scott (1996) believes that a social system is composed of five components – individuals, formal organizations, informal organizations, fusion processes, physical setting – continually interacting. The organization must pay great attention to the motivations and attitudes of the individual, making the aims of the organization and the requirements of the employees the same, and use informal organizations and the fusion process to create a comfortable, safe and healthy physical environment in order to achieve the highest level of synergy.
Hoy and Miskel (1982) propose that in formal organizations, there must be work groups in some form. Through these work groups, the organization's "expectations" and the "requirements" of the employees interact, and both the individuals and organization can adjust the behavior of the other. When employees work in groups, a dynamic relationship exists between organizational expectations and members' needs. Additionally, the work groups themselves will develop their own informal organization, develop rules for the group, and influence the behavior of the organization.

The purposes of this study

This study examines the effects of organizational and individual factors on safety culture in the laboratories of electrical and electronic engineering departments at Taiwanese universities. The organizational factors considered are university size, university ownership, presence of a safety manager, presence of a safety committee, and location of the university. The individual factors are gender, age, years of experience, job title, accident experience, safety training, department, rank, and work site. Both main effects and interaction effects are measured.

METHODS

Population and sample

The population for this study was the teaching staff in departments of electrical or electronic engineering at 70 Taiwanese universities. There were 2,913 faculty (lecturers, assistant professors, associate professors and professors) employed in these departments. We generated a list of all of these faculty members, including information on: their university, their department, name, job title, rank. Among the faculty on this list, 1081 (37.11%) were employed at public universities; 1832 (62.89%) at private universities. 1620 (55.61%) were employed at universities in the northern part of Taiwan; 469 (16.10%) in the central region; and 824 in the south (28.29%). 1629 (55.92%) were employed in electrical engineering departments; 1284 (44.08%) in electronic engineering departments.
Two samples were selected from the population: a pilot sample, and the formal test sample. The pilot sample, a purposive sample of 300 individuals, was surveyed as part of the development of the research instrument. In the middle of October 2006, researchers mailed to each subject a questionnaire, a gift and a return envelope. Two reminders were subsequently sent out, and by late November the same year, 174 completed questionnaires had been received. 10 of these were invalid, leaving 164 valid questionnaires, a response rate of 54.67%. The formal test sample of 687 subjects was selected from the list of faculty by simple random sampling. In early December 2006 researchers began mailing the questionnaires to subjects as for the pilot. Three reminders were sent, and by the end of January 2007, 403 completed questionnaires had been returned. 30 were invalid, leaving a total of 373 valid responses, a rate of 54.29%.

Instrument

The mailed questionnaires contained two parts. The first part asked for general information, which was used to determine five organizational factors (size, ownership, safety manager, safety committee, location) and nine individual factors (gender, age, job tenure, job title, accident experience, safety training, department, rank, laboratory type). The second part comprised 21 items (all Likert five-point items) that formed the safety culture scale (SCS). Also included in the second part were 37 items related to another study. The safety culture scale contained three sub-scales: artifacts, safety climate, basic assumptions. An example of an item in the artifacts scale is: "The lab I most often work in is a safe workplace." An example from the safety climate scale is: "I am very willing to attend regular health & safety training." An example from the basic assumptions scale is: "If there is plenty of safety equipment in the lab, injuries can be avoided." All items were answered on a five-point scale (strongly disagree, disagree, neutral, agree, strongly agree), and the answers were assigned numerical values from 1 (strongly disagree) to 5 (strongly agree).
All of the scales were subject to item analysis, factor analysis and reliability analysis. They were shown to have good construct validity and internal consistency. The researchers also invited five specialists in this field to assess the content validity of the scales (Gay, 1992). These consultant specialists examined the list

of items to confirm the definition of safety culture being used; they also assessed the relevance, appropriateness and clarity of the items (DeVellis, 1991). The questionnaires were adjusted based on the comments of the specialist consultants.

Data analysis

The statistical software used was SPSS 12.0 and LISREL 8.72. The statistical procedures applied were exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and two-way MANOVA.

RESULTS

Respondent profiles

In the pilot study, there were 164 respondents. Ownership: 80 (48.78%) were from public universities, 84 (51.22%) from private. Region: 47 (28.66%) were from northern universities, 66 (40.24%) from central Taiwan, 50 (30.49%) from the south, 1 (0.61%) did not specify region. Department: 92 (56.10%) worked in electrical engineering departments, 72 (43.90%) worked in electronic engineering departments. The data gathered in the pilot study was used for EFA.

In the formal survey, there were 373 respondents. Ownership: 124 (33.24%) public, 249 (66.76%) private. Region: 190 (50.94%) northern, 63 (16.89%) central, 120 (32.17%) southern. Department: 209 (56.03%) electrical, 164 (43.97%) electronic. The figures for ownership and regions in the sample are slightly divergent from the population. However, the sample proportions for department are very close to the population proportions, which means that the survey results can be generalized to the population. CFA and two-way MANOVA were applied to the formal survey data.

EFA results

The objective of factor analysis is to determine the underlying structure of variables (Hair, et al., 2006). In this study, the main dimensions of safety culture were found through principal component analysis, using an orthogonal rotation. All factor loadings were greater than 0.50, so all of the factors should be retained (Hair, et al., 1998). Four of the factors had eigenvalues greater than 1 (5.61, 4.04, 2.81, 2.43). These four factors explain 70.92% of the variance. These four factors were named (1) “basic assumptions”, (2) “artifacts”, (3) “perceived risk and emergency response”, and (4) “commitment to safety”. A Cronbach’s alpha reliability test was used to check consistency and reliability. For each factor the reliability (Cronbach’s alpha) is greater than 0.70; for the scale as a whole, reliability is 0.93. This suggests an acceptable level of internal consistency (Cooper, 1998; DeVellis, 1991; Nunnally, 1978).

CFA results

Following the EFA, a model of safety culture was developed with four factors. CFA was used to confirm the construct validity of the safety culture scale (Pedhazur & Schmelkin, 1991). The initial hypothesized model is shown in Figure 1. Maximum likelihood estimation was used to fit the data.

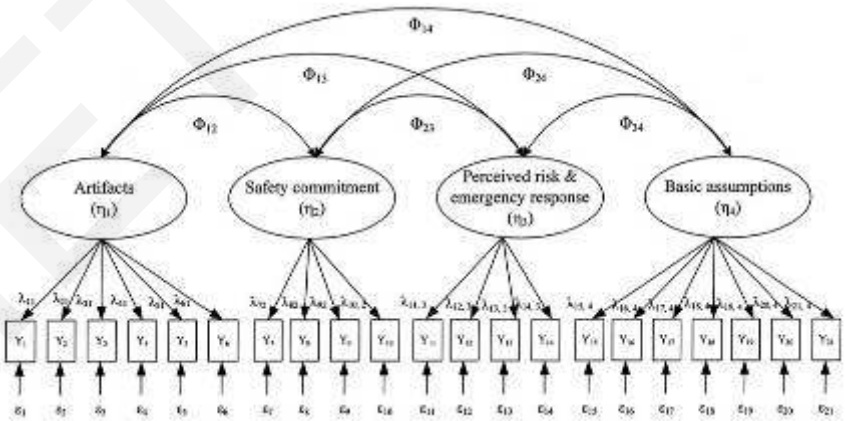

Fig. 1. Initial hypothesized confirmatory factor analysis model

Before assessing the fit of the model, it is necessary to check for offending estimates (estimated coefficients) in the structural model or measurement model that exceed acceptable limits. Examples of offending estimates include: (1) negative error variances or nonsignificant error variances for any construct; (2) standardized coefficients exceeding or very close to 1.0; (3) very large standard errors associated with any estimated coefficient (Hair et al., 1998). In these data there were no negative error variances; standardized coefficients were between 0.11 and 0.94, not too close to 1.0; and standard errors were not large (0.00 – 0.17). There were therefore no offending estimates, so we could proceed with

assessing the overall model fit.

Absolute fit measures. The chi-square (χ^2) value is 975.87 (df = 183, p = .000), which demonstrates that there is a significant difference between the predicted variance-covariance matrix and the observed sample matrix (Brown, 2006). χ^2 is easily affected by the size of the sample (Bagozzi & Yi, 1988), so Bollen (1989) recommends that other fit measures should be taken into consideration when assessing a model with χ^2. The root mean square error of approximation (RMSEA) is 0.11. This is not acceptable, using figures from Browne and Cudeck (1993), i.e. RMSEA $\leqq$ .08. The standardized root mean square residual (SRMR) = 0.08, which is acceptable (Hu & Bentler, 1999).

Incremental fit measures. Non-normed fit index (NNFI) = 0.94; comparative fit index (CFI) = 0.94. According to the rules of thumb given by Hu and Bentler (1999), acceptable levels for both NNFI and CFI $\geqq$0.95. By these measures, the model is not acceptable.

Parsimonious fit measures. Parsimonious normed fit index (PNFI) = 0.81; parsimonious goodness of fit index (PGFI) = 0.63. Both the PNFI and the PGFI range from zero to 1.0, with higher values indicating greater model parsimony (Kelloway, 1998).

Of the seven evaluation criteria, four suggest that the model is not acceptable. With more than half the criteria unacceptable, it is necessary to carry out model modification (Diamantopoulos & Siguaw, 2000). We fixed, in turn, epsilon 12 (model B), epsilon 16 (model C), epsilon 21 (model D), epsilon 10 (model E). After these modifications, most of the evaluation criteria were within acceptable limits.

After overall goodness-of-fit assessment, it is possible to assess the fit of the internal structure of the model. This includes construct reliability or composite reliability, convergent validity and discriminant validity. The construct reliability for the four latent variables were between 0.82-0.94, all above the significance level of 0.60 recommended by Bagozzi and Yi (1988). In terms of convergent validity, factor loadings (λ) were between 0.58 and 0.94. The average variances extracted for the four factors were between 0.51 and 0.75. These values are also higher than the reference value of 0.50 given by Bagozzi and Yi (1988). In terms of discriminant validity, the χ^2 difference value with an associated p value less than .05 ($\Delta\chi^2 > 3.84$, Δdf = 1, $p < .05$) supports the discriminant validity hypothesis (Bagozzi & Phillips, 1982). In another context, the approximate confidence interval for the true correlation using the standard error does not include the value 1 (Jöreskog & Sörbom, 1993). We conclude the four dimensions are discriminable. None of the four can be eliminated or incorporated into another dimension.

Two-way MANOVA

A two-way MANOVA test was used to find interaction effects between the five organizational factors (size, ownership, safety manager, safety committee, location) and the nine individual factors (gender, age, years of experience, job title, accident experience, safety training, department, rank, and work site). Four interaction effects were found to be significant: safety manager with work site; and safety committee with gender, age and rank. The other 41 possible interactions did not show significant effects.

Interaction effects of safety manager and work site on safety culture

The interaction effect of safety manager and work site was significant (Wilks'Λ = .910, p = .027), however it is only significant in one dimension: risk perception and emergency response (F = 4.620, p = .000). The simple main effects of these two factors are also significant. A *post hoc* comparison is showing the disordinal interaction is presented in Figure 2. However, the main effect of work site on safety culture is not significant (Wilks'Λ = .913, p = .037, but a *post hoc* comparison of ANOVA was not significant). This means that whether or not work site affects perceptions of safety culture depends on the presence or lack of a safety manager. The simple effects of work site on perception cannot be viewed in isolation. Figure 2 shows that there is no significant difference in risk perception and emergency response between faculty in different laboratories, no matter whether the university has a safety manager or not. But for faculty in electrical labs, those at universities with safety managers had higher scores for risk perception and emergency response; while those in other types of lab (control, components, computer, communication, other) showed no such variation.

Interaction effects of safety committee and gender on safety culture

The interaction effect of safety committee and gender was significant (Wilks'Λ = .971, p = .031) however it is only significant in one dimension of safety culture: artifacts (F = 4.869, p = .028). The simple main effects of these two factors are also significant. A *post hoc* comparison indicates that there is no significant difference between the safety culture perceptions of male and female faculty, no matter whether they are at universities with or without safety committees. Among male faculty, those at universities with safety committees do show stronger perception of artifact safety culture than those at universities with no safety committee. However, among female faculty, there were no significant differences.

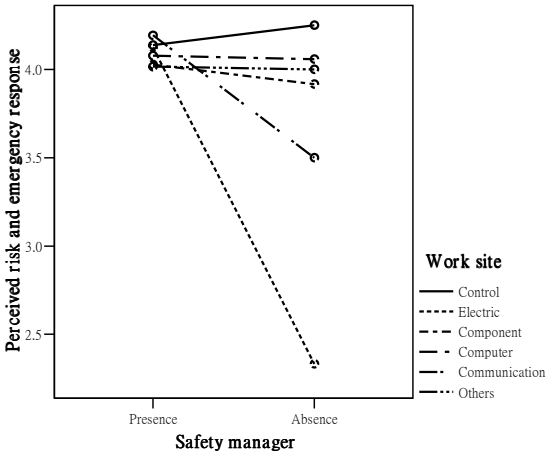

Fig. 2. Interaction effects of safety manager and work site on perceived risk and emergency response.

Interaction effects of safety committee and age on safety culture

The interaction effect of safety committee and age was significant (Wilks'Λ = .959, p = .005) however it was only significant in two dimensions of safety culture: safety commitment (F =13.406, p = .000) and risk perception and emergency response (F = 5.418, p = .020). The simple main effects of these two factors are also significant. A *post hoc* comparison showing the disordinal and ordinal interactions is presented in Figures 3. This figure shows that at universities with safety committees, there is no significant difference in safety commitment with age. However, at universities without safety committees, the scores for 45-65 year old employees were higher than those of 25-44 year olds. Among young (25-44) employees, safety commitment was higher at universities with safety committees; among older (45-65) employees, there was no significant difference between universities with and without safety committees.

In terms of risk perception and emergency response, older employees had higher scores than younger employees, no matter whether their university had a safety committee or not. For younger employees, scores were higher at universities with safety committees; for older employees, there was no significant difference between universities with and without safety committees.

Interaction effects of safety committee and rank on safety culture

The interaction effect of safety committee and rank was significant (Wilks'Λ = .940, p = .033) however it is only significant in one dimension of safety culture: artifacts (F = 2.700, p = .046). The simple main effects of these two factors are also significant. A *post hoc* comparison shows that rank does not have a significant impact on artifacts safety culture at either universities with safety committees or those without. But among lecturers and assistant professors, artifacts perceptions were better at universities with safety committees than at universities without; among professors and associate professors, there was no significant difference between universities with and without safety committees.

Fig. 3. Interaction effects of safety committee and age on commitment to safety.

DISCUSSION

The role of safety managers in promoting a safety culture is to assist in the development and monitoring of communication links between management and employees on safety matters (Cooper, 1998). Safety managers thus promote a positive safety culture. They can take three distinct organizational roles (expert, coordinator, controller) with three corresponding activities (safety counseling, safety coordination, safety controlling) (Hale, 1995). They reduce risk in the workplace and improve employees' emergency response capabilities. Wu, Liu and Lu (2007) have found that the safety climate is better in the labs of universities with safety managers than in those without. In practice, electrical engineering labs have generators, transformers and other electrical equipment, so there is a higher than normal risk of electric shocks and electrical fires. When these accidents happen, they tend to be more serious than in other laboratories. Emergency response is therefore a challenge for teaching staff in electrical engineering labs. One result found in this study is that there is an interaction effect between safety managers and type of laboratory. We therefore recommend that those universities without safety managers should do more to control risks in electrical labs, and should improve the emergency response skills of the teaching staff in these labs.

The presence of a safety committee promotes safety communication between management, labor representatives and safety managers in the drafting of safety regulations (Cooper, 1998). As Weil (1994) suggests, safety committees can improve safety performance through their role as ongoing forum for resolving safety issues. O'Toole (1999) finds that establishing a safety committee can help employers reduce work-related injuries. Wu et al (2007) suggest that the safety climate in laboratories at universities with safety committees is better than at universities without a safety committee. In practice, the vast majority of teaching staff in electrical and electronic engineering departments are men. With limited resources, it may be impossible to bring about comprehensive improvement in the artifact situation for male faculty members. In addition, as men, they have fewer opportunities to attend safety committees, so they have fewer opportunities for safety communication. An interaction effect on safety culture was found in this study between gender and safety committee; we recommend that universities without safety committees should do more to improve the artifacts situation for male faculty.

Super (1957) suggests that humans between the ages of 15 and 24 are in an exploration stage; 25-44 is the establishment stage; 45-64 is the maintenance stage. Individuals in the exploration stage seek to explore their roles, to explore their professions, and to make a commitment. In the establishment stage they work to establish a secure status and professional position, and their commitment gradually grows stronger. In the maintenance stage they maintain the status and achievements that they already have; their commitment to their profession is fixed. University faculty generally must have a master's degree or a doctorate, so they only begin work at a relatively advanced age. Those aged 25-44 can therefore be seen as either in the exploration or establishment stages, and those aged 45-64 could be in either the establishment or maintenance stages of their careers. An interaction effect was found in this study between age and safety committee; we recommend that universities without safety committees should work to improve the safety commitment of faculty aged 25-44. All universities, with or without safety committees, should aim to reduce workplace risks for faculty aged 25-44, and to improve their ability to respond to emergency situations.

University professors and associate professors occupy positions of considerable seniority, so they have many opportunities to take on management and senior administrative roles. They can have a major influence on the safety arrangements in the labs for which they are responsible. Assistant professors and lecturers are relatively less senior, and have a lower status in the university hierarchy. Their influence is fairly minor, and the safety arrangements in their labs are not attended to with the same care. There is an interaction effect between rank and safety committee. We recommend that universities without safety committees should improve the artifacts situation in the workplaces of lecturers and assistant professors.

One of the limitations of this study is that it covers only electrical and electronic engineering departments. The results may not be generalizable to other departments. Departments are microcosms of universities, and each microcosm has its own culture (Clark, 1989). The combination of organizational and individual factors may generate different safety culture outcomes in different departments. Also, as Guldenmund (2000) points out, though the concepts of safety culture and safety climate are similar, they do differ: in origin, features, functions and methods of measurement. Future research could further clarify the definitions and dimensions of safety culture and safety climate, and explore the relation between the two.

ACKNOWLEDGEMENT

The National Science Council of the Republic of China (Taiwan) under grant NSC 95-2516-S-241-001 and NSC98-2511-S-241-002-MY2 supported this research. The support received was greatly appreciated.

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PERCEPTIONS OF ARABIC LANGUAGE TEACHERS' OF THEIR COMPETENCIES AND USAGE OF INTEGRATION TECHNOLOGY IN JORDANIAN SCHOOLS

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ABSTRACT A convenient sample of 40 Arabic language teachers of elementary school students from 14 public schools were selected and nominated by school principals in Al-Zarqa Educational Zone to take part in this study. A three scale questionnaire was used to investigate Arabic language teachers' perception of their competences (TPC) scale and usage of integration technology in their classrooms (TPU) scale and the obstacles and incentives of using CALL in teaching Arabic (OIS). Results showed that there were significant differences between teachers' perceptions of their competencies and technology Integration. The results also revealed gender significant differences in teachers' usage of technology in the classroom in favor of male teachers. Moreover, significant differences in teachers' usage of technology integration in the classroom were found due to years of experience. Also, teachers with more years of experience reported lower levels of lack of incentives than those with less years of experience.

Keywords: *Technology Integration, Teachers' Perceptions, Obstacles; Incentives, Arabic Language Teachers, Primary Fifth grade stage.*

INTRODUCTION

Current Arabic Computer-assisted language learning (CALL) systems have the weakness that learners cannot phrase in an Arabic sentence freely. Similarly, they cannot guide the learner to correct the most likely ill-formed input sentences. The learner just accepts the information which follows the programmed instruction that is pre-installed in the computer. For these systems to be useful, more research to combine Natural Language Processing (NLP) techniques with language learning systems is needed. Parsing, the core component in Intelligent Computer-assisted language learning (ICALL) systems, allows the system both to analyze the learner's input and to generate responses to that input (Holland, Maisano, & Alderks, 1993). Allowing learners to phrase their own sentences freely without following any pre-fixed rules can improve the effectiveness of ICALL systems, especially when the expected learner answers are relatively short and well-focused (Boytcheva, Vitanova, Strupchanska, Yankova, & Angelova, 2004). Both the well- and ill-formed structure of the input sentence can be recognized. The learner should be allowed to correct the typed sentence independently.

In Arabic ICALL, there are two main types of test items for interaction with the learner—selection-type that tends to elicit answers easily classified as right or wrong and supply-type requiring the learners to write a few words. The objective test method is used to assess the learner's knowledge or skills where each question has one (and only one) correct answer—and there is no ambiguity about what that correct answer should be. The present system guides learners to recognize by themselves the erroneous or inappropriate functions of their misused expressions. In other words, it helps learners to make use of their errors. It doesn't give them the correct answer directly but it enables them to try over and over again. In this system, we use NLP tools (including morphological analyzer and syntax analyzer) and error analyzer to issue feedback to the learner. Furthermore, we propose a mechanism of correction by learners which allows the learner to correct the typed sentence independently, and allows learners to realize what the error is. Arabic ICALL follows the curriculum of Arabic grammar at the Egyptian primary schools. The linguistic computation of an Arabic sentence is a difficult task (Othman, Shaalan, & Rafea, 2003). The difficulty comes from several sources: (1) the length of sentences and the complexity of Arabic syntax; (2) the omission of diacritics (vowels) in written Arabic ''altashkiil''; (3) the free word order nature of Arabic sentence; and (4) the presence of an elliptic personal pronoun ''alDamiir almustatir''. For these reasons, there is very little research involving Arabic (I) CALL (Ditters, Oostdijk, & Cameron, 1993). Research into Arabic Computer-assisted language learning (CALL) can be classified by two approaches: the Computer as a tool and the Computer as a tutor. In the Computer as a tool approach, some computer programs can be used as a tool that does not necessarily provide any language material at all, but rather empowers the learner to use or understand language. In the Computer as a tutor

approach, the process of finding the right answer involves a fair amount of student choice, control, and interaction. Hegazi, Ali, Abed and Hamada (1989) presented a way of representing Arabic syntax in Prolog as production rules. The system can detect some errors concerning Arabic syntax, and so can be used for an educational environment. Abou Ela (1994) developed an expert system, the Arabic Syntax Analyzer (ESASA), which can be used as a tool to assist Arabic linguists in building Arabic grammar rules. The grammar is expressed using a declarative language called Grammar Writing Language (GWL). This tool is aimed at building Arabic natural language applications including CALL. The absence of diacritics, which represent most vowels, in the written text creates ambiguity which hinders the development of Arabic natural language processing applications. Thus, ambiguity increases the range of possible interpretations of natural language (Othman, Shaalan, & Rafea, (2003).Using the Internet for publishing web-based CALL materials that contain non-Latin alphabets requires the solution of various technical problems. There are so many unknown factors associated with the operating system of a distant user that affect the browsing characteristics of these materials. Cushion and Hemard (2002) described how recent technological developments have provided the possibility of overcoming these technical problems in conjunction with the Java programming language and the Unicode character numbering system. Shaalan (2005) developed an Arabic grammar checker, called Arabic GramCheck. Arabic GramCheck looks for common Arabic grammatical problems, describes the problem, and offers suggestions for improvement. This program is useful in pointing to problems believed typical of native speaker writing. Thus, the learner can avoid such problems in future. Gheith, Dawa, and Afifty (1996) developed Instructional Software for Teaching the Arabic Language (ISTAL) for grade one prep school. The system presents the curriculum as a simple concept associated with a set of generated sentences. Then, the system generates an exercise for the student and the student's answer is automatically evaluated by comparing it to the system's solution. For example, in Egypt, where there is a growing demand in using computers for teaching and learning, some publishers of off-the-shelf school textbooks provide students with either CD's or web sites that contain vocabulary and grammar practice.

The educational units include Arabic grammar lessons for the primary level. Specifically, they cover the following:

الجملة (pronouns)؛ الضمائر (verbs)؛ الأفعال (dual and plural)؛ المثنى والجمع (adjective)؛ النعت (nouns)الأسماء ؛ أنواع الخبر (types of the enunciative)؛ المبتدأ والخبر pred (inchoative and enunciative) ؛ الإسميّة(nominal sentence) ؛ النداء (circumstantial accusative)؛ الحال (adverb)؛ الظرف (conjunctions)؛ العطف (verbal sentence)الجملة الفعلية ؛ إن وأخواتها (Inna and her sisters)؛ المفعول المطلق (unrestricted object)؛ المفعول لأجله (causative object)؛ (interjection) ، وأنواع (Kana and her sisters)؛ كان وأخواتها (types of predicate of Inna and her sisters)؛ أنواع خبر إن وأخواتها (types of predicate of Kana and her sister)؛ الحروف (articles).خبر كان وأخواتها

The primary stage teacher plays a pivotal role in the development of technology-based literacy skills. Most early childhood educators see the computer center as an important activity center for learning (Haugland, 2000). In the computer center, children can have many opportunities to integrate learning across content areas (Morrow, Gambrell, & Pressley, 2003). To support children's learning in the computer center, teachers should take the time to observe each child and provide them with many opportunities for independent explorations on the computer.

As we increasingly depend on computers for learning, our expectations of language teachers will inevitably change. The aim here has been to highlight generic applications found on virtually any computer in the world so Arabic instructors will feel less inhibited about employing the basic technologies of word processing, e-mail, and the Internet in Arabic language learning (Madhany, 2005). These technologies can assist the teacher in project-based learning where the technology is adapted to the learner rather than vice versa. The best Arabic learning still occurs at the hands of brilliant teachers who use flexible, universal technologies to amplify their pedagogy, not to replace it.

Considering what we already know about teacher technology use, and in spite of the fact that technology-using teachers are seeing the impact on their students, published studies support what we suspect, that teachers are not using technology (Roblyer, 2004). Yet, the integration of technology and quality teaching are said to be inseparable. Content knowledge and pedagogical knowledge, as indicators of quality teaching, become readily evident within the process of technology integration that includes definition, planning, strategies, student management, and assessment (Pierson, 2001). However, technological knowledge must be modeled and emphasized in teacher education programs in order to ensure its understanding and its appropriate, successful application by the teacher in the K-12 classroom (Martin, 2004; Martin & Crawford, 2004; Martin & Crawford, 2005). Special educators are more likely to use technology competently if it has

been embedded in coursework and field experiences (Martin, 2004). Based on indications reflecting a need for better training of teachers, the following issues related to technology use and teacher education programs have been identified: (a) university faculty factors such as a lack of modeling of technology in courses; (b) lack of technology implementation in activities and coursework; (c) a lack of expertise to develop complex technology mediated instruction; and (d) lack of technology integration in education field experiences (Ludlow 2001; Roblyer, 2004). Technology integration at schools and factors affecting such integration has drawn the attention of many researchers and has been of high interest to them. A number of studies have been conducted to explore teachers' use of technology and factors hindering such use (e.g., Anderson & Maninger, 2007; Becker & Ravitz, 2001; Gulbahar, 2007; Zhao, 2007). Parallel with the same purpose, this study aimed to investigate how a primary school teachers perceive their competence of technology integration, and their usage of these technologies in teaching Arabic language in classrooms, in addition the study explore the barriers and incentives relating to successful technology integration in the school. Therefore, the study first illustrated the technology integration approach and the barriers that prevent teachers from using technology integration in their teaching.

STATEMENT OF THE PROBLEM

In the light of the information revolution and the scientific challenges of the 21st, century, there is a sweeping trend to use computers in all aspects of life and education is no exception. On the other hand, the world is heading towards knowledge economy and a lot of money will be invested in computer assisted language learning instructional software programs. Therefore, it is worth investigating the effectiveness of such CALL programs on the performance of learners.

DEFINITION OF TERMS

Technology Use is implemented most often as an instructional tool, but it is the teacher's job to help the student to learn; computers, videos or the like. Technology Integration focuses more on supplementing what the students are already beginning to study, thus allowing for further questioning and investigation into individual subject areas and deeper understanding of topics and information. **Technology Integration** thus actively engages the learner in the activity and into the learning process. Such integration technologies (web making software, wikis, etc.) "require students to think about what they know in different, meaningful ways" (Jonassen, Carr, & Yueh, 1998).

STUDY QUESTIONS

The current study addresses the following research questions:

1. What is the level of fifth primary grade Arabic Language teachers' perceptions of their competencies in Technology Integration in classrooms?
2. What is the level of fifth primary grade Arabic Language teachers' perceptions of their usage of Technology Integration in classrooms?
3. What is the level of fifth primary grade Arabic Language teachers' perceptions of the obstacles and incentives of Technology Integration in classrooms?
4. Is there a significant difference between teachers' perceptions of their competencies in Technology Integration in classrooms and their perceptions of their usage of it?
5. Is there a significant difference between teachers' perceptions of their competencies, of their usage of technology Integration, and obstacles and incentives related to successful Technology Integration due to gender, qualification, and years of teaching experience?

IMPORTANCE OF STUDY

The domain of CALL in Jordan is in need of more research. To the researchers' best knowledge, studies about computer – based instruction in Jordan are not so many. A few studies about the use of CALL by Arabic language teachers have been conducted. It is anticipated that this study will shed light on the competencies and the usage of Call by Arabic language teachers in Jordan. Thereupon, the findings of this study may be functional for different categories of people; it may help EFL curricula designers and EFL

methodologists develop practical ways to train and encourage teachers to use CALL in their classrooms. Finally, this study may encourage other researchers to conduct further studies on the same topic, which will enrich both the local and international literature.

LIMITATIONS OF THE STUDY

This study is confined to Arabic Language teachers of fifth primary stage students in the second semester of academic year 2009/2010 in Zarqa Area schools-Jordan

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REVIEW OF RELATED LITERATURE

Numerous studies have been carried out to identify the extent of technology usage among school teachers, and factors facilitating or prohibiting technology integration in the classroom, particularly computers. Some studies focus on the availability of computers in the classroom, sharing of resources, a supportive administration, and a strong support staff as the primary influencing factors. As an example, the Becker and Ravitz (2001) study showed that computer use among teachers is related to more constructivist views and practices and to changes in practice in a more constructivist-compatible direction. Bauer and Kenton (2005) found that teachers, who were highly educated and skilled with technology, were innovative and adept at overcoming obstacles, but they did not integrate technology on a consistent basis both as a teaching and learning tool. Results suggest that schools have not yet achieved true technology integration. Gulbahar (2007) concluded that teachers and administrative staff felt themselves competent in using ICT available at the school; they reported a lack of guidelines that would lead them to successful integration. On the other hand, students reported that ICT is not utilized sufficiently in their classes. Zhao (2007) conducted a qualitative research to investigate the perspectives and experiences of 17 social studies teachers following technology integration training. The research indicated that teachers held a variety of views towards technology integration. These views influenced their use of technology in the classroom. Most teachers were willing to use technology, expressed positive experiences with technology integration training, increased their use of technology in the classroom, and used technology more creatively.

In addition, other research studies suggest that there is a relationship between a teacher's student-centered beliefs about instruction and the nature of teacher's technology-integrated experiences (Judson, 2006; Totter, Stutz, & Grote , 2006). Similarly, ChanLin et al. (2006) conducted a study to identify the factors affecting eight teachers' use of technology in creative teaching practicies. The identified factors were classified into four categories: environmental, personal, social and curricular issues. Besides ChanLin's study, Anderson and Maninger (2007) investigated the changes in and factors related to students' technology-related abilities, beliefs, and intentions. Statistically significant changes were found in students' perceived abilities, self-efficacy beliefs, value beliefs, and intentions to use software in their future classrooms. Students' self-efficacy, value beliefs, and intentions were moderately correlated with each other. Abilities were correlated with self-efficacy and computer access. The best predictors of intentions were self-efficacy beliefs, gender, and value beliefs.

METHODOLOGY AND PROCEDURES

SAMPLE OF THE STUDY

The population of this study included teachers of Arabic Language in primary state schools in Zarka. A convenient sample of 40 teachers from 14 schools located in Zarqa city in Jordan were voluntarily recruited to participate in the study and filled in the study questionnaire which were designed for the purposes of the current study. They declared they have technological aids in their classrooms such as internet access, computers, data shows, projectors, video, etc. 40% per cent of the participating teachers were females. 85% of participants hold bachelor degree (BA) in Arabic Language and Literature and the rest are currently enrolled in the Master (MA) different relevant programs in Jordanian universities; 40% had 3-6 years of teaching experience, 37.5% less than 3 years, and 22.5% had more than six years, with average age for the whole sample (M=36.6; SD= 4.6) with age range from 29-45 years. Each school has two computer laboratories (with 25 computers and a projection system), one electronic classroom (with 25 computers, a projection system, overhead projector and TV-video set), and one library. School has 71 computers for administrative staff and

teachers' use and 75 computers for student use (1:13 ratio at student level). In addition, there are 31 overhead projectors, 10 TV-video sets, 2 computer-projection systems and 4 VCD players at school.

INSTRUMENTATION

The instrument used in the current study was developed after a thorough review of the literature worldwide, especially research related to technology integration and language construction development. The survey questionnaire consists of two sections. A demographic section gives a description of the sample used in the study, such as gender, type of educational certification degree (bachelor-Master), and years of working experience. The second section includes three scales; Teachers' Perceptions of their Competencies Scale (TPC Scale), which consists of 22 items using a 3-point scale of responses, with 3 indicating strongly agree and 1 indicating strongly disagree; Teachers' Perceptions of their Usage Scale (TPU Scale), which consists of 22 items used in the TPC Scale a 3-point scale of responses, but this time asking how frequently the teachers practice the behaviors described in the 22 items, with 3 indicating always and 1 indicating never; thirdly, the last part contains obstacles and incentives scale (OIS), and employing a 5-point Likert-type scale of responses, with 5 indicating strongly agree and 1 indicating strongly disagree.

VALIDITY AND RELIABILITY OF THE QUESTIONNAIRE

The face validity of the study questionnaires was established by refereeing it by a panel of university professors with different specializations, including educational technology, Arabic language and Information Technology [IT] teaching methods, in addition , the researcher selected ten Arabic language male and female teachers who identified themselves as providers of technology integration in their teaching practice.The team of panel professors and teachers was asked to validate the content of the questionnaires with regard to instructions, the relevance of questions to target assessed variable, its suitability to the research goals and objectives, and the number questions. The remarks of the validating team, their notes and suggestions were taken into consideration, and the researcher made the necessary modifications before implementing the instruments. The three questionnaire (TPC, TPU and OIS Scales) validity using Cronbach's Alpha was 0.94; 0.88; 0.91 respectively.The questionnaires reliability was obtained through a test-retest method, which was applied on a pilot group of (24) teachers who were chosen from the population of the study and excluded from the sample. The scales were repeated on the same group to check its reliability two weeks later. The reliability correlation coefficient of the test-retest was calculated using Pearson correlation formula. It was found to be (0.84), which is considered to be suitable from a statistical point of view for the purpose of this study.

DATA ANALYSIS

Data gathered from the questionnaire items were analyzed using SPSS 15.0. Descriptive statistics, a t-test, multivariate analysis, and analysis of variance (ANOVA) were used. In addition, the researcher analyzed these items using "Item Analysis" method in order to get a deep understanding of the results from the questionnaire.

FINDINGS

Question 1: "What is the level of fifth primary grade Arabic Language teachers' perceptions of their competencies in Technology Integration in classrooms? Results indicated that teachers moderately regard their competencies in technology integration (M=*1.82*). The mean scores ranged from *1.64* to *2.09* on a 3-point scale, see (Table 1). This moderate perception by teachers might be due to the fact that technology integration in classrooms highly affected by the barriers involved in this process though it is a part of teacher evaluation particularly at public schools. Investigating the items in details, the highest mean scores were for items that are related to teachers' ability to use presentation and analysis, word processing applications, utilize computers to assess students learning hardware and software, using technology to locate, evaluate, and collect information from a variety of sources. While the lowest mean scores were for items that are related to teachers' ability to integrate language labs to enhance students" learning. These results conform to Bauer and Kenton (2005), where they found that teachers were highly skilled with technology and had the competencies required from successful technology integration. In addition, they were also supported by Zhao (2007) who investigated the perspectives and experiences of 17 social studies teachers following technology integration training.

Table 1: Teachers ' Perception of their Competencies in Technology Integration

	Items	*M*	*SD*
1.	Selecting the appropriate computer programs related to language teaching and learning	*1.8*	*.533*
2.	Engaging students in the selection of technology-based materials	*1.8*	*.648*
3.	Using computer programs related to language teaching and learning	*1.9*	*.693*
4.	Producing technology-based materials such as brochures and pamphlets	*1.8*	*.549*
5.	Employing technology to get and assess information retrieved from different resources	*1.9*	*.545*
6.	Using technology for data presentation and analysis	*2.0*	*.525*
7.	Discussion of safety and health issues related to technology use	*1.8*	*.463*
8.	Operating a computer using a variety of software packages	*1.9*	*.619*
9.	Employing terminology related to computers and employing appropriate technology for written and oral communications	*1.8*	*.549*
10	Using devices such as scanners, digital cameras, and/or video cameras with computers and software	*1.8*	*.500*
11	Utilizing word processing applications	*2.0*	*.597*
12	Employing computers for creating databases	*1.9*	*.530*
13	Using spreadsheet applications such as MS Excel	*1.9*	*.552*
14	Creating multimedia presentations such as PowerPoint presentations	*1.9*	*.632*
15	Employing adaptive & assistive devices for students with special needs	*1.9*	*.530*
16	Designing web sites	*1.8*	*.533*
17	Using distance learning hardware and software	*1.9*	*.590*
18	Using computers to assist students with special needs	*1.8*	*.405*
19	Utilizing computers to assess students learning	*2.0*	*.749*
20	Integrating language labs to enhance students" learning	*1.7*	*.619*
21	Integrating technology to enhance students" learning	*1.9*	*.729*
22	Using computer programs that enhance students" reading ability	*1.8*	*.516*
	TOTAL	*1.82*	*.116*
	Range	*1.64*	*2.09*

Question 2 " What is the level of fifth primary grade Arabic Language teachers' perceptions of their usage of Technology Integration in classrooms? Results showed that teachers weakly regard (M=*1.57*) their practice of technology integration. The mean scores ranged from *1.32* to *1.82* on a 3-point scale, see (Table 2). This low moderate perception by teachers might be due to the fact that technology integration in classrooms in reality faced by the many obstacles that prevent teachers from conducting it such as anxiety, lack of administrative cooperation and encouragement, lack of enough time and resources etc. particularly at public schools. Investigating the items in details, the highest mean scores were for items that are related to teachers' use of word processing applications. While the lowest mean scores were for items that are related to teachers' use of terminology related to computers and employing appropriate technology for written and oral communications. These results are supported by Ertmer, Addison, Lane, Ross, and Woods (1999) who found that teachers' perceptions of the role of technology are closely linked to how technology is used. Another study confirming the results of this study was conducted by Kotrlik and Redmann (2005), where results revealed that although teachers feel some anxiety when it comes to technology integration, they perceived that they are effective in using technology.

Table 2: Teachers ' Perception of their usage of Technology Integration

	Items	*M*	*SD*
1.	Selecting the appropriate computer programs related to language teaching and learning	*1.6*	*.545*
2.	Engaging students in the selection of technology-based materials	*1.5*	*.640*
3.	Using computer programs related to language teaching and learning	*1.6*	*.627*
4.	Producing technology-based materials such as brochures and pamphlets	*1.5*	*.598*
5.	Employing technology to get and assess information retrieved from different resources	*1.5*	*.598*
6.	Using technology for data presentation and analysis	*1.7*	*.554*
7.	Discussion of safety and health issues related to technology use	*1.5*	*.506*
8.	Operating a computer using a variety of software packages	*1.7*	*.588*
9.	Employing terminology related to computers and employing appropriate technology for written and oral communications	*1.4*	*.505*
10	Using devices such as scanners, digital cameras, and/or video cameras with computers and software	*1.6*	*.585*
11	Utilizing word processing applications	*2.0*	*.599*
12	Employing computers for creating databases	*1.7*	*.588*
13	Using spreadsheet applications such as MS Excel	*1.5*	*.638*

14	Creating multimedia presentations such as PowerPoint presentations	*1.6*	*.585*
15	Employing adaptive & assistive devices for students with special needs	*1.8*	*.648*
16	Designing web sites	*1.7*	*.576*
17	Using distance learning hardware and software	*1.7*	*.697*
18	Using computers to assist students with special needs	*1.6*	*.496*
19	Utilizing computers to assess students learning	*1.7*	*.757*
20	Integrating language labs to enhance students" learning	*1.6*	*.540*
21	Integrating technology to enhance students" learning	*1.6*	*.585*
22	Using computer programs that enhance students" reading ability	*1.6*	*.590*
	TOTAL	*1.57*	*.114*
	Range	*1.32*	*1.82*

Question 3 "How do teachers perceive obstacles and incentives related to successful technology integration in the classroom? Results indicated that teachers moderately reported existence of obstacles and incentives interfere with their using technology integration (M=3.30; 3.36) respectively. The mean scores for obstacles ranged from *2.62* to *4.04*, and for incentives from *2.42* to *3.83*, on a 5-point scale (see Table 3). Results showed that teachers perceive large number of students per class as major obstacle that hinder their technology integration in their classrooms (see Table 3). They also perceive Lack of participation in special workshops to prepare them well and availability of additional resources for classrooms as reasons that discourage them to integrate technology, see (Table 3).

These results conform to Ismail, Almekhlafi and Al-Mekhlafy (2010), where they found that barriers that hinder technology integration among teachers include lack of training on how to integrate technology effectively, and that most teachers depend on self learning, and they need to be involved in subjects that enable them to learn technology integration techniques and strategies so they can use it successfully in their classes.

Table 3: Teachers' Perceptions of Obstacles and Incentives Related to Successful Technology Integration in Classroom

	Obstacles	M	SD
1	The teacher does not have much time to prepare and implement them	4.00	0.751
2	Curricula are not ready to use such new technologies	4.00	0.816
3	Difficulty in usage of technology in teaching due to the large number of students per class	4.37	0.627
4	Technologies are not available in schools	4.00	0.815
5	Equipped labs are not available in schools	4.10	0.810
	Incentives		
6	Not enough encouragement to use them	4.12	0.790
7	No positive evaluations	4.12	0.647
8	Lack of participation in special workshops	4.25	0.588
9	Availability of additional resources for classrooms	4.15	0.699
10	School or educational zone recognition program	4.12	0.790

Question 4 "Is there a significant difference between teachers' perceptions of their competencies in Technology Integration in classrooms and their perceptions of their usage of it? T-tests for Paired Samples showed that there is a significant difference in all items of the scales between teachers' perceptions of their competencies in Technology Integration in classrooms and their perceptions of their usage of it, as seen from (table 4), Teachers' perceptions of their competencies were more higher than it was their using of it in every items except for three concerning utilizing word processing applications, designing web sites and using distance learning hardware and software. Figure (1) depicts differences between Teachers' Perception of their Competencies and Usage of Technology Integration.

Table 4: Results of Paired Samples T-tests of Teachers ' Perception of their Competencies and Usage of Technology Integration

	Items	*Competencies*		*Usage*		T-Test
		M	*SD*	*M*	*SD*	
1.	Selecting the appropriate computer programs related to language teaching	*1.8*	*.533*	*1.6*	*.545*	*2.91***

	and learning					
2.	Engaging students in the selection of technology-based materials	*1.8*	*.648*	*1.5*	*.640*	*3.36***
3.	Using computer programs related to language teaching and learning	*1.9*	*.693*	*1.6*	*.627*	*2.76***
4.	Producing technology-based materials such as brochures and pamphlets	*1.8*	*.549*	*1.5*	*.598*	*3.67***
5.	Employing technology to get and assess information retrieved from different resources	*1.9*	*.545*	*1.5*	*.598*	*4.05***
6.	Using technology for data presentation and analysis	*2.0*	*.525*	*1.7*	*.554*	*3.34***
7.	Discussion of safety and health issues related to technology use	*1.8*	*.463*	*1.5*	*.506*	*4.05***
8.	Operating a computer using a variety of software packages	*1.9*	*.619*	*1.7*	*.588*	*2.96***
9.	Employing terminology related to computers and employing appropriate technology for written and oral communications	*1.8*	*.549*	*1.4*	*.505*	*3.81***
10.	Using devices such as scanners, digital cameras, and/or video cameras with computers and software	*1.8*	*.500*	*1.6*	*.585*	*3.12***
11.	Utilizing word processing applications	*2.0*	*.597*	*2.0*	*.599*	*1.000*
12.	Employing computers for creating databases	*1.9*	*.530*	*1.7*	*.588*	*2.68***
13.	Using spreadsheet applications such as MS Excel	*1.9*	*.552*	*1.5*	*.638*	*4.28***
14.	Creating multimedia presentations such as PowerPoint presentations	*1.9*	*.632*	*1.6*	*.585*	*3.13***
15.	Employing adaptive & assistive devices for students with special needs	*1.9*	*.530*	*1.8*	*.648*	*2.87***
16.	Designing web sites	*1.8*	*.533*	*1.7*	*.576*	*1.778*
17.	Using distance learning hardware and software	*1.9*	*.590*	*1.7*	*.697*	*1.533*
18.	Using computers to assist students with special needs	*1.8*	*.405*	*1.6*	*.496*	*3.12***
19.	Utilizing computers to assess students learning	*2.0*	*.749*	*1.7*	*.757*	*3.16***
20.	Integrating language labs to enhance students" learning	*1.7*	*.619*	*1.6*	*.540*	*1.96***
21.	Integrating technology to enhance students" learning	*1.9*	*.729*	*1.6*	*.585*	*3.12***
22.	Using computer programs that enhance students" reading ability	*1.8*	*.516*	*1.6*	*.590*	*3.12***
	TOTAL	*1.82*	*.116*	*1.5*	*.114*	*13.96***

**p< 0.05*

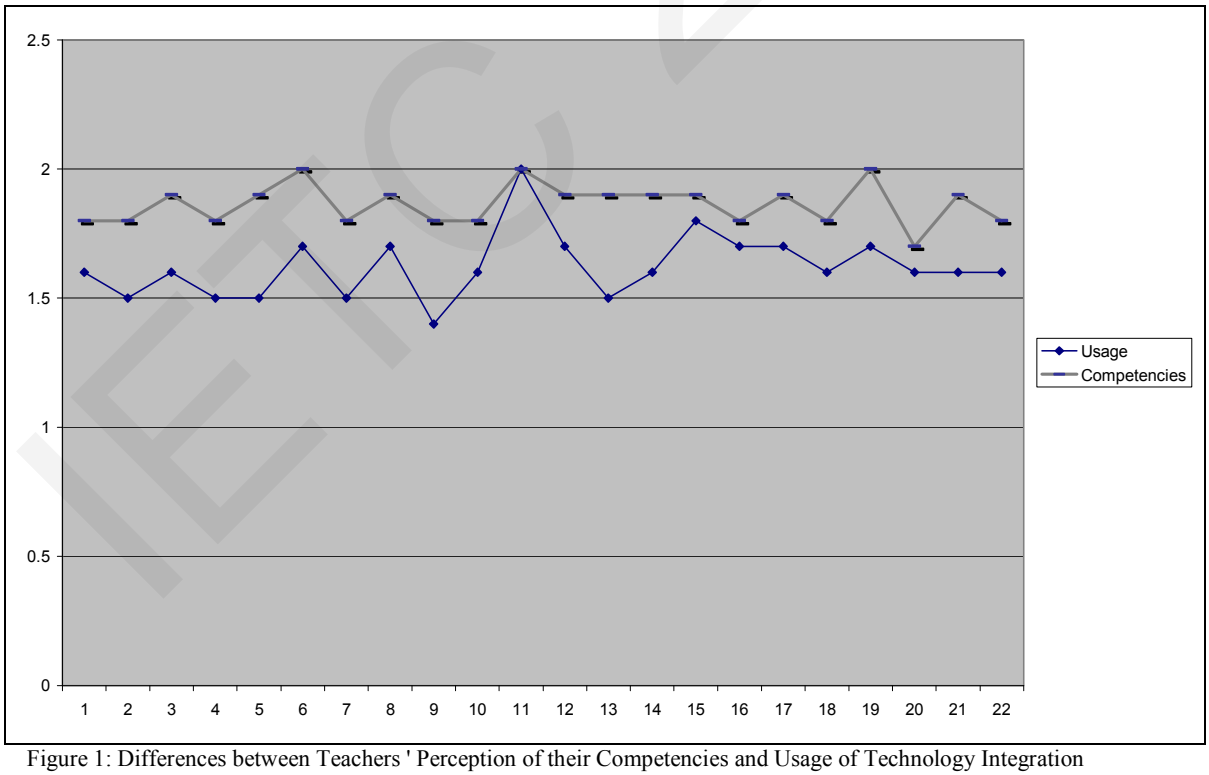

Figure 1: Differences between Teachers ' Perception of their Competencies and Usage of Technology Integration

To answer the first part of question 5 “What is the difference in perception of competence, usage of technology integration and obstacles and incentives among male and female teachers?” a multivariate analysis

was run. Results indicated a significant difference between the two groups only on usage of technology integration with a Hotelling's trace value of 2.94 with a significant f. of 2.27. To locate the significant differences within subscales, a one way analysis of variance (ANOVA) was run for the three scales' items. However, in order to control Type I error when conducting the analysis of Variance, the researchers adjusted α level (0.05) using Benfaroni modification method. The adjusted value of α is ≤ 0.005. Table 4 shows the items that yielded significant differences within the sub-themes. As seen from the table 5/1, technology availability was a concern for female teachers more than it was for males. In spite of this fact, results showed that female teachers use different types of technologies more than male teachers do. The means scores for female teachers on technologies used are all above 4.4, while the mean scores for male teachers ranged from 2.5 to 3.5. This might indicate that female teachers integrate technology in their classrooms more than male teachers do. On the other hand, Hong and Koh (2002) found that female teachers were more anxious than male teachers toward hardware. They also found that the overall computer anxiety levels of male teachers were not significantly different from the anxiety levels of female teachers. Only for the hardware anxiety domain were significant differences detected between male and female teachers.

Table 5/1: Differences between Male and Female Arabic Language Teachers in their Perception of Technology Integration

	Teachers Perception of their Competencies in Technology Integration	M	F	f
1	Using computer programs related to language teaching and learning	2.1	1.5	8.72**
2	Creating multimedia presentations such as PowerPoint presentations	1.7	2.2	8.55**
3	Using distance learning hardware and software	2.0	1.6	6.61**
	Teachers Usage of technology in the classroom			
1	Selecting the appropriate computer programs related to language teaching and learning	1.7	1.3	5.00*
2	Operating a computer using a variety of software packages	1.9	1.5	5.35*
3	Using distance learning hardware and software	1.9	1.5	4.51*
	Obstacles			
1	Equipped labs are not available in schools	3.9	4.7	3.24*
	Incentives			
1	Lack of additional resources for classrooms	3.9	4.3	4.30*
1	**TOT-Teachers Perception of their Competencies** in Technology Integration	1.83	1.79	1.126
2	**TOT-Teachers Usage** of technology in the classroom	1.61	1.52	6.66**
3	**TOT-Obstacles**	3.31	3.29	.018
4	**TOT-Incentives**	3.28	3.48	3.95*

**p< 0.05*

To answer part two of question 5 "What is the difference in perception of competence, usage of technology integration and obstacles and incentives among teachers with different levels of teaching work experience?" Significant differences in teachers usage of technology integration in the classroom, were found according to years of experience where teachers with more years of experience [more than 11 years], showed higher levels (M=36.91), than those with years of experience [6-10 years (M=34.64); and less than 6 years (M=33.42). also teachers with more years of experience [11 and more years] reported lower levels of lack of incentives (M=15.8), than those with years of experience [less than 6 years (M= 16.6); and 6-10 years (17.5). (table 5/2). No significant differences were found in terms of teachers' level of certification.

Table 5/2: Differences Between Arabic Language Teachers in their Perception and Usage of Technology Integration according to years of working experience (group 1[less than 6 years]; group 2 [6-10 years]; group3 [more than 11years])

		Years of work experience			
		1	2	3	
		M	M	M	f
1	TOT-Teachers Perception of their Competencies in Technology Integration	1.80	1.79	1.90	3.00
2	TOT-Teachers Usage of technology in the classroom	1.51	1.57	1.67	7.12**
3	**TOT-Obstacles**	3.43	3.30	3.09	2.16
4	**TOT- Incentives**	3.32	3.50	3.16	3.87**

**p< 0.05*

DISCUSSION AND RECOMMENDATIONS

This study, along with others of its kind, brings to light the reality of real issues affecting technology integration in schools versus technology use and the real dynamics that keep that vision from taking firm hold in public schools. By integrating a quantities approach in this study, the researchers were able to gather real issues and frustrations that if taken into a broader picture, apply to many schools and districts to their inability to upstart technology rich classrooms and curricula. Additionally, there is a need for more professional development programs that help teachers learn how to use technology and to be transferred from the workshop model of "how" to use a tool to the more sophisticated professional learning group model that encourages sustainability and accountability across the curriculum (Guhlin, Omelas, & Diem, 2002; Jenson, Lewis, & Smith, 2002; Willis & Cifuentes, 2002). However, as some scholars have noted, simply becoming more comfortable with the technology and understanding a tool does not equal nor "ensure effective technologically facilitated teaching" (Harris & Hofer, 2009, p. 23). Most researchers and teachers agree that professional development for teachers in the area of technology integration must continue to evolve from the 2 hour "this is the technology and here is how to use it" workshop to a sustainable model from which teachers can "systemically change instruction" (Brock, 2009, p. 10) and learn from other educators' failures and successes over a period of time (Jenson et al., 2002). The integration of technology into content, as reflected by the Technological Pedagogical Content Knowledge (TPACK) model (Mishra & Koehler, 2006) should locus on the interplay of technology, pedagogy, and content knowledge. As noted by Mishra and Koehler (2009) "Knowledge of technology, content, and pedagogy does not exist in a vacuum; it exists and functions within specific contexts" (p. 16). Peer coaching and modeling technology lessons in teaching and learning (Joyce & Showers, 2002) may help teachers contextually overcome personal and classroom barriers, to think outside the box (Wright & Wilson, 2005-2006), and to develop "creative repurposing" (Mishra & Koehler, 2009, p. 16), to use a technology that is specific to the teacher's classroom and curricular needs, and to create better in-service teacher training and learning opportunities for faculty and pre-service teachers in university teacher education program (TEP) to understand and integrate technology in elementary education classrooms.

CONCLUSIONS

Technology should be used as a tool to support instruction. Educational choices have to be made first in terms of objectives, methodologies, and roles of teachers and students before decisions on the appropriate technologies can be made. No technology can fix bad educational philosophy and practice. The challenge is to rethink learning objectives and to align the learning technologies with these objectives. Since technology adoption and utilization are an ongoing issue, there is still need for further investigation. The successful implementation of computers in the classrooms may depend on how well the teachers are prepared to use technologies. There is a need to identify the competencies teachers must posses to use computer technology effectively in classroom. An important question to address is-which teacher competencies are viewed as important for the development and operation of computer technology in K-12 and college school settings. Research studies should focus on various facets of technology implementation and innovation and their specific effects, as well as how students and teachers use technology, rather than simply comparing different delivery methods.

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PERSONALIZATION PRINCIPLE IN MULTIMEDIA LEARNING: CONVERSATIONAL VERSUS FORMAL STYLE IN WRITTEN WORD

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Abstract: The purpose of the study is to examine the multimedia software designed as appropriate to the conversational style and to the formal style with respect to various variables. The model of nonequivalent control group was used in the study and the group studying with the multimedia material in formal style included 22 students, and the group studying with the multimedia material in conversational style included 23 students. An achievement test, the cognitive load scale for both groups and a questionnaire for students' views about the style used in the personalized group were used as data collection tools. A significant difference was found between the cognitive load scores of the students in the personalized group and those of the students in the nonpersonalized group. However no significant difference was found between the background knowledge levels of the personalized and nonpersonalized groups, the posttest achievement scores of the students in the personalized group and those of the students in the nonpersonalized group. In the study the learners stated that the style used in the software motivated them to study and they felt as if they were talking to a human; that they preferred similar multimedia software to be used in their other courses; and that they emphasized the use of such multimedia software in face-to-face education.

Keywords: Multimedia learning, personalization, conversational style, formal style

INTRODUCTION

A student working with multimedia software is alone but with texts, narrations, feedback and cues in multimedia software, the student is provided to be in a conversation. Therefore, Mayer suggested the *personalization principle*. According to the personalization principle, people learn better through multimedia presentations in which the words are in the conversational style rather than in the formal style (Mayer, 2005, 2009). Mayer and his colleagues, in all the 11 experiments they carried out, found out that in multimedia courses, the students taking the instructional content via the conversational style demonstrated better performance in transfer tests than the students taking the instructional content via the formal style (Mayer, 2009).

In the literature, there are several studies investigating the influence of the multimedia instructional messages - given in the conversational style (personalized) and the formal style (nonpersonalized) - on students' achievement. Moreno and Mayer (2000), examined whether the multimedia messages given in conversational and formal style in a multimedia science lesson increases learning through a study involving five experiments. The instructional content was presented via narration in the first, third and fifth experiments and via the text on the computer screen in the second and fourth experiments. In the study, it was concluded that the students receiving the instructional content via the conversational style demonstrated better performance in problem solving tests than those receiving the instructional content via the formal style. Mayer, Fennell, Farmer, and Campbell (2004) examined the performances of the students taking the personalized or non-personalized versions of a narrated animation explaining how the respiratory system of the humans functions. At the end of all the three experiments the researchers conducted, they found out that the students in the personalized group were significantly more successful in transfer tests than those in the non-personalized group. Similarly in another study carried out by Moreno and Mayer (2004), the students studied via an agent-based multimedia educational game. The agents used personalized or non-personalized speech. The students learning via the personalized version were more successful in the reminder and problem solving tests. The related literature demonstrates that in the studies conducted with the conversational style and formal style, the learners studied via software for a quite short period of time (60 seconds, 140 seconds and so on). In the present study, the learners

studied the instructional content for 30 minutes. Therefore, this study could be said to be carried out in a more realistic learning environment.

Purpose of the Study

The purpose of the study was to examine the multimedia software designed as appropriate to the conversational style and to the formal style with respect to various variables. In line with this overall purpose, the research questions were as follows:

- Is there a significant difference between the post-test achievement scores of the students studying with the multimedia software designed based on the conversational style and the post-test achievement scores of those studying with the multimedia software designed based on the formal style?
- Is there a significant difference between the cognitive load scores of the students studying with the multimedia software designed based on the conversational style and the cognitive load scores of those studying with the multimedia software designed based on the formal style?
- What are the views of students studying with the multimedia software designed based on the conversational style about this software?

METHOD

This part of the paper presents the research model, participants, data collection tools, multimedia materials, application process and data analysis.

Research Model

In the study, the model of nonequivalent control group was used. In this model there is no special effort to equate the groups via objective assignment, but it is especially important to have subjects as similar as possible.

Participants

The participants of the study were 3rd grade students taking the course of Scientific Research Methods-ARY204 in the Department of Computer Education and Instructional Technologies (CEIT) at the Education Faculty of Anadolu University. In the study, the group studying with the multimedia material in formal style included 22 (4 female and 18 male) students, and the group studying with the multimedia material in conversational style included 23 (6 female and 17 male) students.

Data Collection Tools

In the study, an achievement test, the cognitive load scale and a questionnaire for students' views about the style used in the personalized group were used as data collection tools.

Achievement test: Including ten multiple choice test items was developed by the researcher.

Cognitive load scale: 9-point likert-type scale was developed by Paas and Van Merriënboer (1993) and adapted to Turkish by Kılıç and Karadeniz (2004). The internal consistency coefficient of the scale translated into Turkish was 0.78, and the Spearman Brown split half test correlation was 0.70.

Questionnaire: Including 10 five-point likert-type items and an open-ended question about the style used in the personalized group was developed by the researcher.

Multimedia Instructional Materials

For the application of the study, the lesson unit of "t test and t test types" of the course of Scientific Research Methods - ARY204 – was developed as a multimedia material by the researcher and one academician. First, in line with the objectives of the lesson unit, the content was prepared, and two

multimedia materials with the same content but in different styles (conversational and formal styles) were designed. The multimedia instructional materials were prepared with the Adobe Flash software, and for the preparation of the visuals, the Adobe Photoshop software was used. Following the development of the instructional software, the materials were presented to three experts in the fields of subject matter, graphics and instructional design. In line with the views and suggestions of the experts, the instructional materials were finalized.

Treatment Process

During the application carried out in the Fall Term of the academic year of 2010-2011, the following process was followed:

- In the first course hour, the academic achievement test (pretest) was applied to the students in both groups.
- The students in the first group studied individually with the multimedia instructional material prepared in conversational style, and the students in the second group studied individually with the multimedia instructional material prepared in formal style. During the application, the cognitive load scale was presented to the students in paper-and-pencil form. The scale included a cognitive load scale question regarding each concept found in the application, and the students marked the appropriate option in the scale after they studied each concept.
- At the end of the application, the students in both groups took the academic achievement test (posttest).
- The students in the personalized group were given the questionnaire developed regarding the formal style of the software they studied with.

Data Analysis

Mann-Whitney U test was applied to answer the first research question; for the second research question, independent samples t test was run; and regarding the third research question, mean scores were used for the analysis of the quantitative data, and for the analysis of the qualitative data, descriptive analysis was used. In order to interpret the mean scores regarding five-point likert-type questionnaire items, the formula of (n-1) was used. The score ranges of 1,00-1,80 represented “strongly disagree”, 1,81-2,60 “disagree”, 2,61-3,40 “partly disagree”, 3,41-4,20 “agree” and 4,21-5,00 “strongly agree”.

FINDINGS

Background Knowledge Levels

There was no significant difference between the background knowledge levels of the personalized and nonpersonalized groups (pretest achievement scores) ($p>.05$). The maximum score to be obtained from the achievement test was 10. As a result of the analysis, it was seen that the pretest achievement scores of both groups (personalized $\overline{X}$ = 1.22, nonpersonalized $\overline{X}$ =2.09) were quite low.

Posttest Achievement Scores

The results of the Mann-Whitney U test revealed no significant difference between the posttest achievement scores of the students in the personalized group and those of the students in the nonpersonalized group ($p>.05$). Although there was no significant difference between the posttest achievement scores of both groups, it was found out that the mean of the personalized group ($\overline{X}$=8.52) was higher than that of the nonpersonalized group ($\overline{X}$=8.40).

Cognitive Load Scores

There was a significant difference between the cognitive load scores of the students in the personalized group and those of the students in the nonpersonalized group ($p<.05$). The cognitive load score of the personalized group ($\overline{X}$=6.03) was found significantly higher than the cognitive load of the

nonpersonalized group ($\overline{X}$=4.67). While the software in the personalized group caused excessive cognitive load on learners, the software in the nonpersonalized group caused low level of cognitive load.

Students' Views about the Software in the Personalized Group

The students in the personalized group believed that the software motivated them, helped them adopt the environment and increased their learning. In addition, the students thought that the conversational style was important and wanted it to be used in face-to-face education. The responses given to the open-ended question of the questionnaire revealed that the learners considered the style friendly and different from the usual style (formal style) and that the style motivated them to study.

DISCUSSION and CONCLUSION

The study aimed at examining multimedia software designed as appropriate to the conversational style and formal style with respect to various variables. In contrast with studies reported in related literature (e.g. Moreno and Mayer, 2000; Mayer, Fennell, Farmer, and Campbell, 2004; Moreno and Mayer, 2004), in the present study carried out, no significant difference was found between the posttest achievement scores of the students in the personalized group and those of the students in the nonpersonalized group. This finding of the present study does not support the personalization principle in multimedia put forward by Mayer (2005, 2009). In the present study, it could be stated that as the learners had a high level of experience in computer use, the personalized group who received feedback designed as polite were not significantly more successful than the nonpersonalized group.

While the software in the personalized group caused excessive cognitive load on learners, the software in the nonpersonalized group caused low level of cognitive load on learners. One of the reasons for this could be the fact that the personalized group was not accustomed to the content presented with the conversational style. In Turkish education system, instructional contents are presented with the formal style. Therefore, students might be unfamiliar with the conversational style.

In the present study carried out on the personalization principle, learners studied for one course-hour (30 minutes) with the software. In contrast with short time (60 seconds, 140 seconds and so on) applications (e.g. Moreno and Mayer, 2000; Mayer, Fennell, Farmer, and Campbell, 2004; Moreno and Mayer, 2004) in related literature, no significant difference was found for the learners' achievement level. Therefore, it is believed that the present study revealed more realistic results. In this respect, the personalization principle should be tested in different courses with different target populations and for a different study time.

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PHYSICAL EDUCATION THEORIES AND TEACHERS' KNOWLEDGE: AN EXPERIENCE OF TEACHING SUPERVISING IN BRAZIL

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ABSTRACT

This article analyzes school physical education (PE) theoretical and methodological frameworks, based upon hermeneutics, a qualitative method of investigation for contextual inferences. The objective is identifying teacher's pedagogical content knowledge, and their "theories of action" to assess the coherency of their "theories-in-use". A sample group composed by sixty-one undergraduate student-teachers was researched during 18 months in São Paulo metropolitan area, southeastern Brazil, searching for assessment criteria about their knowledge on teaching theories, according to international and Brazilian curricular models. The analysis of worldwide curricula pointed out to similarities and discrepancies, thus results have indicated pertinence of both conditions. The integration among curricular propositions seemed desirable to improve teachers' work. Changes in "theories-in-use" are connected with knowledge about theoretical and methodological frameworks. At one hand, the field of PE partially continues with ambiguous teaching practices, but at the other, there are concrete changes related to knowledge about curricular systematizing.
Key-words: Teaching theories, Initial preparation, Pedagogical practice.

INTRODUCTION

Teachers organize pedagogical practice according to a set of theories (Schön, 2000), which include theories of action based on teachers' pedagogical content knowledge, reflective procedures and action-research methods (Barbier, 2002; Thiollent, 2003). Recently in physical education (PE), Tsangaridou and O'Sullivan have analyzed reflective practices (1997), theories of action and theories-in-use (2003), whereas McCaughtry (2004), and McCaughtry and Rovegno (2003) have investigated pedagogical content knowledge. Morford (1972) already pointed out that PE professional field need coherency, therefore teachers' theories-in-use need to be consistent with their theories of action. There is controversy in research findings about this issue, some related to discrepancies (Lawson, 1993) and some to reliability between theories and actions (Tsangaridou & O'Sullivan, 2003). Besides, teachers' pedagogical content knowledge is a significant way of describing the knowledge they use to teach (McCaughtry & Rovegno, 2003).

Tsangaridou and O'Sullivan (2003) investigated experienced teachers' and concluded that more studies are needed with teachers with different levels of experience. McCaughtry and Rovegno used developmental learning theory to assess pedagogical content knowledge, indicating directions to future research, such as the role of reflection and readings in university coursework in order to PE beginning teachers shift to thinking more deeply about teaching. Global issues like these are complex and have incidence in many contexts with different idiosyncrasies. In this way such global problems need local solutions.

Integration among theories is required in complex situations as the teaching process in PE. Do diverse theories of action lead to coherent theories-in-use? Tsangaridou and O'Sullivan (2003) analyzed theories of action with experienced teachers and found that correspondence does exist. This study analyzes different theories of action with inexperienced PE teachers. The expectation is that integrating theories accounts to proper theories-in-use and that teachers' pedagogical content knowledge is a previous condition to work with such integration. Besides, teachers' choices depend on their knowledge about pedagogical issues, such as coherent principles.

Brazilian Physical Education Background

PE in Brazil was related to diverse influences, from health and military interests to gymnastics and sports hegemony in a brief retrospective. The institution of republican democracy, with public policies towards PE, occurred just one year after Black slavery system official ending in 1888 (Sanches Neto & Oyama, 1999). In schools there was concern about youth health and prophylactic procedures, thus the first decades of the XX Century presented contradictory educational policies and unusual social practices as aftermath. There was expansion in educational institutions in inner city areas and urban centers, however those schools were not enough to supply the demand for education. PE classes were associated to gymnastics and calisthenics during World War I, being reinforced by World War II international propaganda until early 1960s, when military generals took over the executive government by 1964.

The following years featured abrupt expansion in education because there was interest in public schools for propaganda. The success of the Brazilian men's football association (soccer) team in 1958 and 1962 FIFA world cup tournaments led to association between school PE and sports, especially soccer. The 1970 FIFA world cup title was the apex of the *panis et circenses* policy, contributing to keep sports contents predominant during 1970s. Only in early 1980s, different PE propositions became relevant in some school programs. Democracy had prevailed in the country and presidential elections happened in 1989, with college faculty engaged in popular political parties and civil rights institutions, because effective liberty was in debate in academic and professional meetings.

Various theoretical and methodological conceptions emerged from that context and approached to school PE with different levels of influence in teachers' practice, including theories of action with diverse pedagogical contents and recurrent theories-in-use. Besides such professional issue for teaching, PE in Brazil has been related to broader scientific conceptions (Crum, 1993; Dufour, 1977), such as five distinguished fields: Kinesiology (Hoffman & Harris, 2002; Tani, 1996), Human Motricity Science (Cunha, 1989; Kolyniak Filho, 1998; Trigo Aza, 2000), Movement Corporeal (Body) Culture (Betti, 1993; Resende, 1992), Sports Sciences (Ferreira Neto, Goellner, & Bracht, 1995; Haag, Grupe, & kirsch, 1992), and Health related Physical Fitness (Böhme, 1993; Corbin, 1981; Malina, Bouchard, & Bar-Or, 2004; Marques & Gaya, 1999). All school propositions described in this work are related to at least one of these fields.

RESEARCH METHODS AND PROCEDURES

Each proposition has been analyzed from a hermeneutic standpoint, apprehended in Betti (1997), Harris (1983) and Park (1986), thus its inner and outer elements have been considered. This method allows comprehending a particular speech as a semantic element and, beyond that, a symbolic issue. It points out an interpretation conflict (Ricoeur, 1978, 1983) between approaches' limitations and possibilities, and then makes possible to identify propositions that are not only likely to be valid and coherent but the likeliest and most coherent ones.

Hermeneutics was used because it is a method that consists in decoding hidden issues in apparently logical, objective, and literal assumptions. According to Ricoeur (1978) there is interpretation wherever multiple conjectures do exist, because symbols, speeches, and interpretations are correlative elements. Such plurality of ideas needs validation since any interpretation should be likelier than others, therefore the revision of all documents was based on the analytical investigation method (Thomas & Nelson, 1996), emphasizing positive, negative, critical, and contradictory aspects in relation to previously collected data about school PE teachers' practice (Borges, 1998; Bracht et al., 2003; Bracht, Pires, Garcia, & Sofiste, 2002; Celante, 2000; Darido, 1997; Moreira, 1992).

Documents consisted in manuscripts, theses, and dissertations to verify scientific relevance; legal projects and public service assessments for professional relevance; and research data about teachers' practice to infer teaching relevance. The importance of such documentation has been attested by organizations that sustain the largest budget for all scientific research projects in São Paulo and in Brazil, respectively FAPESP (São Paulo State Research Support Foundation) and CNPq/MEC (Ministry of Education Council of Research).

Data Analysis

The analysis was centered in the following three criteria to identify common PE concepts present in various propositions. The first criterion refers to scientific pertinence. It was necessary to comprehend what PE means as a scientific field in Brazil and what kind of relations connects Brazilian PE to the international context. Five different categories emerged: Kinesiology, Human Motricity Science, Movement Corporeal (Body) Culture, Sports Sciences, and Health related Physical Fitness. Attempts to

integrate some of them were also noticed in Cavalcanti's (1996), Lawson's (1989), Lovisolo's (1995), and Tani's (1997) works.

The second criterion referred to professional idiosyncrasies, which were inferred from the requirements of public service assessments for PE teachers occurred in Brazil (São Paulo, 2008) and their possible relations to international research in this field (Crum, 1993; Dufour, 1977; Lawson, 1990; Morford, 1972; Park, 1989). Some propositions were emphasized according to social and political demands. Some of them were predominant in a global scale, involving Asian, European, North and South American countries like Brazil.

The third criterion consisted in establishing the teaching relevance of every theory, i.e., its practical elements. The conception of practice was based on reflection and action relationships (Schön, 2000). Several discrepancies appeared among fifteen theories, according to recent sources involved in action-research projects (Bracht, Pires, Garcia, & Sofiste, 2002; Celante et al., 2005; Sanches Neto, Monteiro, & Almeida, 2005): psychomotricity (psychokinectic education), humanistic, progressist, developmental, critical, constructivist, phenomenological, systemic, revolutionary, critical-overcoming, plural (cultural plurality), critical-emancipatory (empowering), health studies, national curricular parameters (NCP), and kinesiology studies (a summary of all conceptions is featured in the *Table* excerpts). Besides the analysis of each conception's authors, there were found meta-analyses inside many propositions, i.e., authors that remarked discrepancies in order to enhance their own propositions' main lines. In the other hand, authors that defended the dynamics in progress among propositions (Betti & Kuriki, 2011; Sanches Neto & Betti, 2008) highlighted the similarities in different approaches.

Participants, Framework, and Trustworthiness

After the revision process of all propositions' pedagogical principles, this study comprehended a design with a sample group composed of sixty-one undergraduate PE student teachers. All students agreed to participate and understood the importance of the investigation to develop some of their teaching skills (Siedentop & Tannehill, 2000). Five predominant scientific concepts of PE and fifteen school PE propositions were taught to this group during three semesters. In the first semester they planned and taught classes with almost absolute degrees-of-freedom, learning pedagogical contents and theories of action related to each conception as well as experiencing the effective use of all theories. During the second semester, they have planned and taught classes based strictly on each singular theory, and during the last semester, they experienced relative degrees-of-freedom in planning and teaching, because theories of action from different propositions could be used.

Four main procedures were used to establish and ensure data trustworthiness. The first consisted in audiovisual registering of all data with videotape, photography, transcription of oral reports, and collective written analyses. The second procedure was discussing research findings with the participants, soliciting that they analyze their own records to verify incoherencies. All participants were submitted to such scrutiny review. The third procedure involved comments by peer professors, graduate students, and teachers from four school PE research groups (Matthiesen, 2005), three of them from São Paulo State and one from Rio de Janeiro. Common issues were reinforced after peer analysis.

The fourth strategy consisted in contents' analysis and categorizing (Franco, 2003; Thiollent, 1984) to search discrepancies and inaccuracies among the three criteria of relevance, and to check which findings were valid for all categories, which data was specific, and which was eventually under or overestimated, or even irrelevant. Conceptual, procedural, and attitudinal dimensions of the contents appeared frequently and were used as parameter to deepen analysis.

PEDAGOGICAL PRINCIPLES AND THEORIES OF ACTION

PE had been through some kind of identity crisis at a given period of time worldwide (Bressan, 1979; Cunha, 1989; Curl, 1973; Felshin, 1972; Henry, 1964, 1978; Lawson & Morford, 1979; Newell, 1990; North, 1968; O'Hanlon & Wandzilak, 1980; Park, 1981; Parlebás, 1971; Pieron, 1975; Rarick, 1967; Renshaw, 1973; Renson, 1989; Ross, 1978; Sage, 1984). Different contexts have featured diverse solutions and propositions to overcome such crisis with repercussions in school PE (Crum, 1993). This diversity resulted in many sources of pedagogical contents and theories of action. In Brazil it happened during the 1980s and due to its later response to the academic versus professional debate in comparison to other regions, Brazilian propositions considered many theories from different countries (Betti, 1996; Tani, 1996).

Few countries in the 1980s held PE preparation courses in only two years, some of them with bivalent options: Denmark, Sweden, Norway, Switzerland, and Saint Domingo. Other countries featured it in three years, like Brazil by that time: Greece, Argentina, India, Israel, Italy, Malta, Paraguay, Tunisia,

and Turkey. Such option was related to the urgency of teachers for elementary and secondary schools. But many countries featured teaching preparation courses in four years, about sixty-two percent in Dufour's investigation (1977). Nowadays, Brazil presents PE preparation courses in three to four years, an option that demands greater quantities of academic personnel, what was impossible in the country before the 1980s qualitative shifting. The following fifteen propositions are the predominant theoretical and methodological approaches to school PE, and were taught to the participants during the research.

Psychomotricity (Psychokinectic Education) Its original nomenclature derived from psychokinetic education and it was first used in educational institutions for students living with mental and physical disabilities (Le Bouch, 1986). Later it was implemented in regular schools' curriculum in France and many other countries like Argentina (Coste, 1978) and Brazil (Negrine, 1987). Theories of action are organized in curricular principles according to this theory, which objective is to enhance cognitive and psychological functions through the movement. Didactic strategies consist in any activities that allow students to elaborate contents that range from synchronism and anticipatory timing, motor coordination, space structuring and organizing to lateral dominance and discrimination. Assessment serves as reference pattern for the teacher.	**Humanistic Approach** This theory dealt with the dichotomy between behaviorist and humanist conceptions, both originated in anthropological approaches (Oliveira, 1983, 1985) with broader sociological repercussions worldwide (Berger & Huntington, 2004). Based on psychology (Rogers, 1978), PE should promote social interactions with cooperative and meaningful learning opportunities for all students (Brotto, 1997). It presupposes physical performance optimization rather than its maximization; moreover every contents selection depends on students' interests with the objective to denote meaning for learning. Indirect methods are usual didactic strategies and assessment involves students' self-evaluation.	**Progressist Approach** It is based on analogous progressist assumptions in pedagogy (Snyders, 1981), which had been analyzed systematically by Libâneo (1985). Ghiraldelli (2001) pointed out this conception of PE as an educational activity that should accomplish political and pedagogical goals. Its objective is to analyze social relationships in constant transformation. Didactic strategies should promote critical analysis of the contents: sportive and general physical activities, play, game, gymnastics, and knowledge about the human body. Assessment consists in overcoming social determiners perceived during the teaching and learning process.
Developmental Approach This theory is centered in the motor development and learning process (Gallahue & Ozmun, 2004; Tani, 2005) with repercussion worldwide (Gallahue, 1987; Tani, Connolly, & Manoel, 1998). The objective is to optimize motor behavior (Manoel, 1989) and the contents are locomotive, manipulative, and stability skills. Didactic strategies consist in motor problems solving in rhythmic activities, play, game, sports, and gymnastics (Tani, Manoel, Kokubun, & Proença, 1988). Assessment serves as reference pattern for the teacher to provide feedback to students and systematize the teaching and learning process (Manoel, 1999).	**Critical Approach** It is based on revision of all legislation (Castellani Filho, 1998) applied to Brazilian educational system during 1980s (Mariz de Oliveira, Betti, & Mariz de Oliveira, 1988) with persistent challenges to its practice (Souza, 2005). The objective is to reflect (Tishman & Perkins, 1995) and participate in motor activities to promote students' global development. Contents involve motor activities, conceptual differences between PE and play, game, sports, dance, gymnastics, and recreation. Didactic strategies vary from ludic and controlled motor activities to readings and reports, according to students' individual and collective interests. Assessment is an analysis of all materials produced in the teaching and learning process.	**Constructivist Approach** To comprehend this theory's fundamentals it is necessary to consider the pedagogical contributions by Vygotsky (Rego, 1995) and Piaget (Carvalho, 2000), whose research findings indicated that knowledge elaboration could be improved with significant environmental interaction (Ben-Hur, 2000). The objective is to construct knowledge and enhance cognitive functions (Freire da Silva, 1989; Freire da Silva & Scaglia, 2003; Mattos & Neira, 1998, 2000). Contents consist in ludic activities from popular culture, especially play and game, and didactic strategies request problem solving by using previous elaborated knowledge (Coll Salvador et al., 1993). Assessment involves students' self-evaluation.
Phenomenological Approach Moreira (1992) had investigated PE teachers' practices and found that their pedagogical content knowledge could not be assessed objectively, without subjective interferences featured in positivist scientific research procedures. Phenomenology would allow teachers to identify the facts in course during the classes and comprehend them as complex phenomena, especially the corporeal manifestations' meanings and the conceptions about the body (Moreira, 1992; Villa, 2003). Its objective is to comprehend corporeal manifestations and the main content is knowledge about the human body. Cross-disciplinary relationships with other curricular subjects are used as didactic strategies and the assessment consists in analysis of all facts happened during the classes from a phenomenological standpoint.	**Systemic Approach** This theory is based on the modern dynamical systems theory (Von Bertalanffy, 1968) and on historical, political, and sociological analyses of PE's major influences (Singer & Dick, 1980). Some principles were proposed to organize teachers' pedagogical actions: inclusion, equifinality, and diversity (Betti, 1991). They mean, respectively, that inclusion of all students in every activity is desirable, as well as different activities could lead to a common problem solving, achieving similar objectives, and as many activities as possible should be used in PE classes. Its objective is to insert students within the movement corporeal culture's expressive manifestations, which are the contents. Didactic strategies are the principles described formerly and assessment is in contextual analysis from the semiotics standpoint (Betti, 1994).	**Revolutionary Approach** Medina (1987, 1996) analyzed the discrepancies between PE's theories and practices, criticizing Brazilian social conditions. The basic fundamentals for this revolutionary theory consist in the need to elaborate utopias in order to overcome diffuse ideologies (Cavalcanti, 1985). Its objective is to overcome the ideology based on a realistic and skeptical standpoint. Contents involve theory and practice of the movement corporeal culture, didactic strategies consist in critique about the social conditions, and assessment is a collective elaboration of utopia by the teacher and the students.
Critical-Overcoming Approach This theory is based on materialistic and historical issues. It has pointed out evidences about intrinsic contradictions in Brazilian social and political organization, besides their influence in PE (Soares et al., 1992). Its primary goal is to promote students' reflective thinking about the movement corporeal culture to realize and overcome as many contradictions as possible. Its objective is to promote social transformation by the comprehension of contents like play, game, sports, gymnastics, dance, wrestling, and capoeira. Didactic strategies are thematic discussions about the movement corporeal culture, thus assessment consists in collective reflection and process systematization by the teacher and the students.	**Plural (Cultural Plurality) Approach** It integrates cultural, social, psychological, and biological aspects in PE classes' planning (Daolio, 1995, 1996). Such integration allowed further associations with diverse sociological, philosophical, and pedagogical theories, e.g., civilizing process, anthropology, and hermeneutics (Betti, 1995). Its objective is to reconstruct knowledge about the movement corporeal culture. Contents are biological, psychological, social, and cultural aspects of play, game, sports, dance, gymnastics, and wrestling. Didactic strategies explore contextual experiences and assessment consists in reflection about body techniques by the teacher and the students.	**Critical-Emancipating (Empowering) Approach** This theory emphasized the worth of critical comprehension in PE. It aims the emancipation of the students' independent thinking, enhancing its degrees-of-freedom (Daniel & Bergman-Drewe, 1998). Didactic strategies used for this purpose are of four kinds: dramatizing, problem solving, broadening, and collective reconstruction of knowledge (Kunz, 1998, 2004). The latter two are named transcendent methods because they apply PE's contents to broader social issues. Its objective is to enhance critical and autonomic thinking, and its contents are play, game, sports, gymnastics, dance, wrestling, and capoeira. Students' self-evaluation of their objective and subjective participation accounts for assessment.
Health Studies It has the health related physical fitness paradigm of prophylaxis for PE classes (Fairclough & Stratton, 2005; Marques & Gaya, 1999). Its goals consist in informing students, changing their health habits, and promoting the systematical practice of exercises in intramurals programs and outside the school context. Both axiology and teleology are similar to the model that had been confronted during the 1980s in Brazil (Nahas, 1997, 2001; Pedraz, 1987), but the main difference is the incorporation of pedagogical principles concerning the inclusion in this renewed view. The objective is to enhance students' autonomy in physical fitness management at an optimal level instead of the maximal level often associated with sports (Guedes & Guedes, 1997), developing physically educated students who should keep active and lasting lifestyles in adulthood (Corbin, 1981).	**National Curricular Parameters (NCP)** This theory is derived from the citizenship concept and its primary goal consists in promoting committed democratic citizenry (Gabelnick, 1998). The Ministry of Education published a series of documents named NCP to integrate all Brazilian basic education (Brasil, 1997, 1998, 1999) with the PE included in every school's pedagogical and political project, according to teachers', students', and community's common interests (Brasil, 1996; CBCE, 1997). Due to its concern with citizenship, ethics, and democratic values some authors labeled it "citizenship approach" (Darido et al., 2001) based on the concept that citizenship means the right to have rights (Betti, 1999; Palma Filho, 1998). Outside Brazil similar propositions are relevant in PE (Coll Salvador, Pozzo, Sarabia, & Valls, 1992; Delignières, 2000; Labarrière,	**Kinesiology Studies** This theory is recent in Brazil (Mariz de Oliveira, 2001), but has similarities with former curricular propositions for PE (Jewett & Bain, 1985). Its objectives involve learning facts, concepts, principles, procedures, rules, values, and attitudes related to the human movement. The contents are organized in four groups: muscular structures and physiological, biomechanical, neural, and psychological potentialities; muscular and neural capabilities; perceptive and motor skills; and relationship with the social and physical environment. Didactic strategies consist in any activities that enhance students' scientific knowledge and assessment is provided by verbal records of the students' comments during the classes, written and graphical documentation, sketches, drawings, phrases, texts, register of answers to direct questions or

Contents involve conceptual, procedural, and attitudinal aspects related to the physical fitness. Didactic strategies consist in non-exclusive physical activities and assessment involves students' self-evaluation as reference for the teacher.	1999; Rodríguez, 2003; Valery, 2001). Its objectives are to build up the citizenship critically and to worth democratic rights with all students' integration within the movement corporeal culture. The contents consist in attitudinal, conceptual, and procedural aspects within the play, game, sports, wrestling, gymnastics, rhythmic and expressive activities, and knowledge about the human body. Didactic strategies involve movement experiences according to the principle of inclusion and transversal themes: ethics, environment, health, gender and sexual orientation, cultural plurality, employment, and consumption. Assessment is provided by reflection about the teaching and learning process to promote the students' autonomy and critical thinking.	questionnaires, and observation.

RESULTS

There is emphasis in theories of action derived from the movement corporeal culture because there were eight propositions related to this area: progressist, constructivist, systemic, phenomenological, critical-overcoming, revolutionary, critical-emancipating, and NCP. The second most representative association happened with kinesiology's five derived propositions: psychomotricity, humanistic, developmental, critical, and kinesiology studies. The next level of association comprehended physical fitness and health studies, as well as movement corporeal culture's and human motricity science's relation with the plural approach. Teachers' theories-in-use were organized in three groups according to different contents' dimensions, because all propositions conceptions are broader than procedural, therefore the conceptual, attitudinal, and procedural dimensions are common goals for assessments.

The undergraduate students emphasized the integration among all areas, corroborating previous findings (Sanches Neto, Penha, & Silva, 2003) and meta-analyses (Dufour, 1977). The Movement Corporeal (Body) Culture is the area with greater pedagogical content diversity in Brazilian teacher education programs. Forty-four percent of the students' sample referred such concentration, followed by 33% of preference for Physical Fitness, 13% for Kinesiology, 6% for Human Motricity Science, and 4% for Sports Sciences.

Such findings are controversial to Darido's (2000) research, which analyzed three public service assessments for PE teachers in the State of São Paulo, considering the requested pedagogical content knowledge in relation to school propositions. Theories and approaches identified in questions compiled from 1986, 1993, and 1998 assessments indicated that in 1986, 22% of PE pedagogical content questions were based on general educational objectives, 22% had been related to the developmental approach, and 4% to the critical theory.

In 1993 there was a change of focus with almost 19% of the questions related to the critical approach, 21% for the developmental approach, and 4% for the constructivist approach. In 1998 the number of requested theories had became six instead of three. Specific pedagogical content questions consisted in 14% for the critical approach, 8% for the developmental approach, 10% for the constructivist approach, 6% for the psychomotricity, 10% for the humanistic theory's cooperative games, and 6% for the NCP.

There was not any noticeable predominance of propositions in the first two semesters, although the student teachers referred to some of them as easier to comprehend and more helpful during practice. It happened to propositions that provided straightforward and detailed theories of action in the pedagogical principles. The NCP approach was predominant in the last semester, denoted by objectives oriented to the citizenship. Three dimensions of the contents were common for class planning and that consisted in a kind of *bias*. The conceptual dimension was noticed in relation to explanations' extent and level of complexity, the procedural dimension was noticed in the use of lines for organization and the activities' complexity, and the attitudinal dimension was noticed in students' participation and indiscipline.

Student teachers pointed out that the language adequacy and the use of audiovisual resources can minimize conceptual discrepancies during the class. The evaluation criteria, the diversity of teaching styles and methods (Mosston & Mueller, 1974) can contribute for procedural questions. The need to explicit the objectives and to establish sincere relationships of mutual confidence with the students, as well as providing their inclusion during the class are related to the attitudinal dimension.

Discussion

PE teachers often combine elements from more than one approach in practice, but their assumptions about pedagogical theories seem to relate to one predominant approach (Bracht, 2003; Bracht et al., 2003; Celante et al., 2005; Darido, 1997). Therefore, their theories-in-use are diffuse from each theory's theories of action. This situation happened in the first two semesters, when the student

teachers used isolated propositions. In the third semester there was more complexity to deal with, because all fifteen propositions could be used. Among them, there was predominance of the NCP proposition perhaps due to its intrinsic attempt to approach different school PE propositions, emphasizing the citizenship.

Dufour noticed integration among some PE approaches in his study involving preparation courses in forty-two countries, including Brazil. Other authors from Argentina (Bracht & Crisório, 2003; Lovisolo, 1995, 2000), Brazil (Cavalcanti, 1996; Taffarel & Escobar, 1994; Tani, 1997), Netherlands (Crum, 1993), and Spain (Cagigal, 1979) followed such integrative perspectives, named essentialist and existentialist by Dufour. The latter consisted in diversity about philosophic and scientific knowledge, didactics, and methodology in opposition to the former, which emphasized objective measurements, techniques, and standardization procedures.

Significant questions must be oriented to present preoccupations, although past conditions and future perspectives (DePauw, 1998) are relevant interferences in this process. The analysis of the Brazilian propositions reinforces the necessity to deepen scope in the professional field (Park, 1989). Do teachers use theories effectively when dealing with pedagogical diversity and complexity? There was consistent use of the propositions that teachers were familiar with the pedagogical contents.

Pedagogical practice is broader than a set of moments with students inside the school environment. It's an everyday process that seems to be never completed due to the possibility of continuous re-signification and elaboration (Bracht et al., 2003). Furthermore, it is linked to social and political context transformations (Betti, 1991) in addition to scientific and philosophical knowledge usage in practical situations. Pedagogical content knowledge is related to the latter issues and extended to how teachers transform their actions in order to teach effectively (McCaughtry, 2004; McCaughtry & Rovegno, 2003), using all immediate conditions and available resources in a competent (Perrenoud, 2004) and skilled manner (Siedentop & Tannehill, 2000).

PE' problems are complex to assess and need complex approaches, e.g., the gap between theories of action and theories-in-use, and the role of the pedagogical content knowledge. Teachers' actions should encompass their theories of action and this dynamical association is essential to formulate a theory of the practice (Betti, 1996) based on research (Lawson, 1993). Even chaotic contexts in which diverse theories of action can emerge have certain order (Tani, 1996), like the fifteen propositions' pedagogical principles. The limitation of this study remains in the possibility to investigate the integration of all theories only in teacher education programs, because meta-analyses about this issue are recent (Celante et al., 2005; Sanches Neto, Monteiro, & Almeida, 2005) and experienced teachers' practice are still linked to isolated conceptions of PE, according to the literature (Bracht, 2003; Celante, 2000; Darido, 1997).

CONCLUSIONS

During the last decades school PE teachers and undergraduate students have been exposed to different pedagogical approaches than before 1980s in Brazil. It was expected that teachers who started practicing upon approaches recollection in college preparation could distinguish themselves in everyday context. Nevertheless, recent sources (Bracht, 2003; Bracht et al., 2003; Darido, 1997) pointed out quite the opposite in relation to those reflective teachers, along with investigations about teachers with non-reflective background (Borges, 1998; Celante, 2000; Moreira, 1992; Resende, 1987). These findings showed that experienced PE teachers tend to avoid new approaches and to maintain traditional practices, although their discourse referred different propositions.

Thereafter is concurrence to recognize the Brazilian propositions' pedagogical sets of objectives, contents, strategies, and assessment criteria as an important issue to improve PE teachers' practice. As this lack of correspondence between theories of action and theories-in-use is a persistent problem outside Brazil (Tsangaridou & O'Sullivan, 2003), this work has been committed in detailing all curricular principles defined by Tyler (1974), according to a combination of three analytical criteria: scientific, professional, and teaching relevance.

Although relevant changes occurred with integrative perspectives in PE (DePauw, 1998; Crum, 1993), changes in teachers' practice are fewer than the emergence of theories of action (Bracht et al., 2003; Darido, 1997). It is possible to search integration among propositions if teachers use different approaches in practice, but first it seems necessary to deal with isolated propositions within school PE programs to verify idiosyncrasies.

Pedagogical contents continuous integration can transform teachers' practice, because the main problem is that teachers do not put in action the theories they think they are following through (Bracht, Pires, Garcia, & Sofiste, 2002). Exceptions like Tsangaridou and O'Sullivan's work (2003) indicate that

more investigations about teachers' theories-in-use are necessary and the present article may contribute to this issue. The main conclusion is that integration among propositions is possible and desirable for qualitative shifting in school PE; moreover, there are perspectives to change already in course.

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POSSIBILITIES FOR USING THE PROGRAMMING PACKET MATHEMATICA IN MATHEMATICAL EDUCATION

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Abstract: The programming packet Mathematica offers an excellent possibility for visualization in mathematical education, because it has a lot of built-in functions. This programming packet enables us to make highly abstract mathematical content more understandable to pupils and students. By using this packet we can find limit value of a sequence and a function, derivative of a function, to draw a function or functions in one coordinate system and etc., which leads to a more simple understanding of these mathematical notions. At the same time, pupils are introduced to the basics of programming and using program applications. We will also analyze the methodological aspect of solving examples in secondary school by using the programming packet Mathematica.

Key words: Mathematica, education, function, sequence, derivative.

INTRODUCTION

Prosperity of a nation in the global economy depends on scientific and technological strength of a country, which with the other side were built on the basis of mathematical education. Mathematics as science have the important, because development of a young mind of the young population depends from the success of teachers.

Successful teaching in mathematics is a complicated operation, which required knowledge of mathematics as a science and its relation with socioeconomic events in a country.

Mathematics occupies a special place in the system of sciences, because if we take into account the application area of mathematics, and the subject of her research, then the mathematics belongs to the group of social sciences and the science of opinion, as the group of natural sciences. Mathematics is used in all scientific disciplines, where it successfully solves their problems in computer technology as an exceptional component of modern times. Therefore, mathematics is a specific and as a subject. The teaching process consists of communication informations for students and they should understand and remember that they can apply later. From that informations, they should get new. This causes many difficulties in the implementation of mathematical contents. The specificity of mathematics derives from its abstractness. So the content from higher levels of abstraction, we should close to the students and forced them to abstract mathematical concepts and objects.

Teaching is a complex process. It has several stages and each stage has its own components. One component is cognition by the adoption process knowledge. This component has three stages: observation, review and implementation. This components are contained in the application of Mathematica, regardless of which combination of the word, with that stage, the method or form application in the current educational process. Successful implementation and motivation are the basics objectives of any educational process, and they depend on the student attention, motivation, need for students to learn and a responsible attitude towards this subject. Student activities is one of the most important requirements of the teaching process for adoption and permanent knowledge.

Traditionally, students learn mathematics by solving mathematical examples and problems. This can have adverse effect and many cases are not enough for deep ability for Mathematics opinion. With improvement of computer technology, we can "revive" and motivate each student in learning mathematics, any more for far learning. Although well known teaching methods and forms in

mathematics for active learning, we can combine them with work in the software package Mathematica. It offers us a great opportunity for visualization in teaching mathematics.

MATHEMATICA-CONTENT AND OPPORTUNITIES

This software package contains a lot of built-in functions, which gives us great opportunities to get results from a short period of time on a task that requires a longer time to reach a solution. By using this packet we can find limit value of a sequence and a function, derivative of a function, to draw a function or functions in one coordinate system and etc., which leads to a more simple understanding of these mathematical notions. At the same time, students are introduced to the basics of programming and using program applications.

Mathematica is a software package designed for mathematicians and others who use mathematics. It can be used as:

- Numeric and symbolic calculator;
- Graphical presentation of data and functions;
- High level programming language.

Mathematica can do everything.Except as an electronic calculatorsit can be used also as a programming language. It may be useful in all areas of mathematics to help students. Working in Mathematica is very simple and anyone who wants to work in it will handle without any problem. Commands are usually the English translation of mathematical terms. Some complicated problems that can not be solved with the help of built-in functions, can be solved with programming in Mathematica. Programming in Mathematica is not different with programming in other programming languages. Algorithms tasks are identical, the programming in Mathematica is the maximum adjusted to work in mathematics and make Mathematica powerful programming language.

Great possibilities of application of Mathematica allows its attractiveness, and as a teaching tool, as well as research tool. The effectiveness of using the package requires "coaching" the mind in formulating the problems in new ways, not just use the new syntax of the old methods. But this package is the application of mathematics in teaching and learning at a distance.

One of the main outcomes, is: if we want good prepared teachers and students who successfully can used the tool, then we should not allow only technical coaching, but also demonstration of didactic principles and fundamental ideas to solve specific problems.

USING MATHEMATICA TO SOLVE EXAMPLES FOR DETERMINING LIMIT VALUE OF A SEQUENCE

Working with students from first year of the course Mathematics 1, where the curricula chapter processed from real sequences and real functions with one variable, we have follow-up observations:

1. Students do not understand the concept for environment of point;
2. The problem with point of accumulation and limit value of sequences;
3. The problem with disruption of function with one variable and optimization;
4. The problem with limit value of function with one variable;
5. The problem with asymptote of function with one variable.

We analyzed these problems of finding a better way for thinking and understanding in the learning process. Normally, we used Mathematica.

We made a simulation for understanding of term with the following examples:

Example 1: We take sequence with a general member $a_n = \frac{(-1)^n}{n}$. This sequence has members $-1, \frac{1}{2}, -\frac{1}{3}, \frac{1}{4}, \mathrm{K}$, that the numerical axis is

```
ListPlot[Table[{(-1)^n/n, 0}, {n, 1, 10}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```

Picture1.

From the picture 1, we look members of the sequences are distributed from left and right to zero. When the number n increases their distance to zero is less and less. We take this distance as an absolute value of difference between the n-th member of sequence and zero:

$$|a_n - 0| = |a_n| = \left|\frac{(-1)^n}{n}\right| = \frac{1}{n}.$$

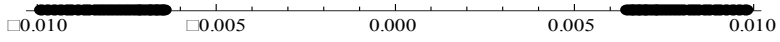
If we take some arbitrary number ε, then we will get inequality

$$|a_n - 0| < \varepsilon \Rightarrow \frac{1}{n} < \varepsilon \Rightarrow n > \frac{1}{\varepsilon}.$$

Distance to zero for all members of the sequence, for $n > \frac{1}{\varepsilon}$, which is less than ε. With other words , all members of the sequence of which is true $|a_n - 0| < \varepsilon$, they are located the ε-environment of point 0, the members are in the interval with a length of 2 ε.

If ε = 0.01, then n> 100, it means that distance to zero for all members of the sequence for which n> 100 is less than 0.01. In the interval (-0.01, 0.01) all members of the sequence for n> 100, which are infinitely many, and only a finite members are not in that interval. This is shown in the picture2:

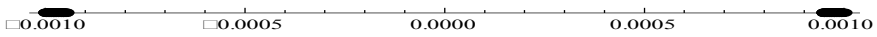
```
ListPlot[Table[{(-1)^n/n, 0}, {n, 101, 155}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```



Picture 2

If ε = 0.001, then n> 1000, it means that distance to zero for all members of the sequence for which n> 1000 is less than 0.001. In the interval (-0.001, 0.001) all members of the sequence n> 1000, which are infinitely many, and only a finite number of members are not in that intervalu. This is shown in the picture 3:

```
ListPlot[Table[{(-1)^n/n, 0}, {n, 1001,1055}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```



Picture 3

It can be concluded, for arbitrary small positive number ε, we can find a natural number $p = \frac{1}{\varepsilon}$, $n > p \in N$, so that all members of the sequences are in ε- environment of point 0th. The point of accumulation is the point 0th.

The conclusion is: the sequence with general member $a_n = \frac{(-1)^n}{n}$ has limit value 0. We tell, this sequence is convergent sequence.

Example 2: We take sequence (a_n) with a general member $a_n = \frac{n}{n+1}$. This sequence has members $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \text{K}$, that the numerical axis is

```
ListPlot[Table[{n/(n+1), 0}, {n,1,15}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```

Picture 4

From the picture 4, we look members of the sequences are in the interval $\left[\frac{1}{2}, 1\right]$. We choose ε-environment of the point 1. That is the interval $(1-\varepsilon, 1+\varepsilon)$, then we can find an integer number p depend of ε, so that all points of the sequence are in that interval. With other words, the distance between any member of the sequence to the point 1 is less than ε when

$$|a_n - 0| < \varepsilon \Rightarrow p = \frac{1}{\varepsilon}, n > p \in N.$$

Then,

$$|a_n - a| = \left|\frac{n}{n+1} - 1\right| = \frac{1}{n+1} < \varepsilon$$

$$n > \frac{1}{\varepsilon} - 1 = p$$

If ε = 0.01, then n> 99, it means that distance to 1 for all the members of the sequence for which n> 99 is less than 0.01. In the interval (0.99, 1.01), all members of the sequence n> 99, which are infinity many, and only a finite number of members are not in that interval.This is shown in the picture 5:

```
ListPlot[Table[{n/(n+1), 0}, {n, 90, 155}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```

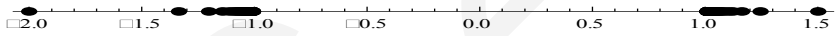
Picture 5

It can be concluded, for arbitrary small positive number ε can find a natural number $p = \frac{1}{\varepsilon} - 1,\ n > p \in N$, so that all members of the sequence are in ε- environment of point 1.

The conclusion is: the sequence with general member $a_n = \frac{n}{n+1}$ has limit value 1. This sequence is convergent sequence.

Example 3: We take sequence (a_n) with a general member $a_n = (-1)^n \frac{n+1}{n}$. This sequence has members $-2, \frac{3}{2}, -\frac{4}{3}, \frac{5}{4}, -\frac{6}{5}, \text{K}$, that the numerical axis is

```
ListPlot[Table[{(-1)^n (n+1)/n, 0}, {n, 1, 100}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```



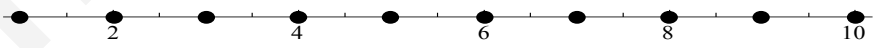
Picture 6

The members of the sequence with even indices are right of the point 1, and the members with odd indices left of the point -1. In this case, we have two points of accumulation 1 and -1.

The conclusion is: no exist arbitrary small interval with distance 2 ε, for that we can find a positive integer number p, witch depends on ε, so that all members of the sequence for $n > p \in N$ are in that interval. This sequence has not limit value. It is not convergent sequence. It is divergent sequence.

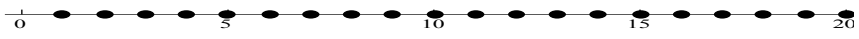
Example 4: We take sequence (a_n) with a general member $a_n = n$. This sequence has members $1, 2, 3, 4, 5, \text{K}$, that the numerical axis is

```
ListPlot[Table[{n, 0}, {n, 1, 10}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```



Picture 7

```
ListPlot[Table[{n, 0}, {n, 1, 20}], PlotStyle → PointSize[0.02], Axes → {True, False}]
```



Picture 8

The members of the sequence are distributed to infinity. In this case, we have not a point of accumulation.

The conclusion is: no exist arbitrary small interval with distance 2 ε, for that we can find a positive integer number p, witch depends on ε, so that all members of the sequence for $n > p \in N$ are in that interval. This sequence has not limit value. It is divergent sequence.

Conclusion

These examples provide the visualization of the problem. In this way, students better remember the term and they apply easily.

The advantages of working with Mathematica are:

1. The mathematical operations are done, for that is necessary to programming in other programming languages;

2. Some mathematical problems have not explicit solutions, they can be seen on their graphs with using numerical methods;

3. For some complex mathematical problems are necessary only solutions. They are easily obtained with Mathematica.

The defects are:

1. This package can not use without other teaching methods and forms. The classical methods and forms of teaching mathematics class can not be replaced with any one programming language;

2. Mathematica can use only to help in teaching math and nothing more.

The reference:

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[2] Mathematics and Mathematica - Natasha Krejić, Djordje Herceg;
[3] Mathematics for Year IV - Blagoj S. Popov, Radojko Sekulovski.

PRE-SERVICE ELEMENTARY MATHEMATICS AND SOCIAL STUDIES TEACHERS'ATTITUDES, EXPERIENCES AND SELF-EFFICACY TOWARDS COMPUTER

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Abstract

The aim of this study is to investigate the effects of daily computer usage, gender difference, ownership of computer and internet connection on computer attitudes, experiences and perceived self-efficacy of pre-service teachers towards computers. The sample comprised 192 graduate students from elementary mathematics education and social studies education at Sakarya University. The survey was used to collect data which consists of 4 sections,designed to measure self efficacy,computer attitudes, computer experiences of pre-service teachers. The results indicated that there is a significant difference between computer attitudes (perceived usefulness), computer experiences, self-efficacy (beginning skills), self-efficacy (files and software skills) and daily computer usage duration. The results also showed that there is no significant difference between gender and attitudes, experiences and perceived self-efficacy towards computer.

Keywords: Perceived Self Efficacy, Computer Attitudes, Computer Experience

INTRODUCTION

Nowadays, the drastic and huge improvement in the technology has affected the communities. This obvious improvement also comes across with the necessity of being able to utilize, manage, understand and evaluate the technology as well. Education has a main role in order to meet this requirement. Therefore, the pre-service teachers who graduated from educational institutions are expected to be capable of finding the knowledge, improving new knowledge and adapting themselves to the new ages by utilizing the technology. For this purpose, curriculum programs of the education institution are restructured and educational technologies are integrated into the all courses that are taught. In order to educate the teachers who are able to use these educational technologies, the pre-service teachers who are studying in the education faculties in the universities are given the computer courses in the 1st and 2nd semester of the undergraduate degree.

According to Wu, "attitudes are individual feelings or perceptions towards objects or actions, which are formed through individual experiences" (Wu, 2009, p.27). The teacher who uses computer technology is a good indicator of his/her attitudes towards computer (Loyd & Gressard, 1984). Teo stated that "the success of student learning with computer technology will depend largely on the attitudes of teachers, and their willingness to embrace the technology" (Teo, 2006, p.413). Positive teacher attitude is very necessary and well-known condition for use of technology effectively in the classroom (Woodrow, 1992).

The integration of technology practices into a pre-service teacher's education can have a positive effect on their confidence level (Pope, Hare, & Howard, 2002). Self-efficacy is the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy is not measured with existing skills, it shows what people believe that they can do with the skills they already have (Eastin and LaRose, 2000). At the same time, people can have higher level of computer self-efficacy with efficiency computer training program (Pamuk, 2007).

The previous computer experience which is dimension of computer attitudes and self-efficacy towards computer. The bad experiences in computer usage that people have had in their past has a significant effect on their self-efficacy and attitude towards computers. If the people have positive experiences about the computers in their past, it will cause them to have a high level of self-efficacy and attitude towards the computers.

The current study aims to investigate pre-service social studies and mathematics teachers' level of computer self-efficacy, experience, and attitude towards computer with respect to socio demographic factors which are gender, ownership of personal computer, ownership of personal internet, daily computer usage duration.

Research Problem

"Do the attitudes, experience and self- efficacy of pre-service teachers' towards computer differentiate in terms of their socio demographic characteristics?

Sub-problems:

a. Is there a significant difference between gender and computer attitudes, experiences,self efficacy of pre-service teachers?

b.Is there a significant difference between ownership of personal computer and computer attitudes,experiences,self efficacy of pre-service teachers?

c. Is there a significant difference between ownership of personal internet connection and computer attitudes,experiences, self efficacy of pre-service teachers?

d. Is there a significant difference between daily computer usage duration and computer attitudes,experiences, self efficacy of pre-service teachers?

METHOD

Sample

The sample of the research consists of 192 students- 58.9% of which are male (n=113), 41.1% of which are female (n=79) - undergraduate students from elementary mathematics education and social studies education at Education Faculty of Sakarya in 2010-2011 fall semester.

Table 1:Demographic characteristics of pre-service teachers

		Frequency	Percent
Gender	Male	79	41,1
	Female	113	58,9
Department	Elementary Mathematics Education	100	52,1
	Social Studies Education	92	47,9
Ownership of computer	Yes	90	46,9
	No	102	53,1
Ownership of internet	Yes	93	48,4
	No	99	51,6
Daily of computer usage	0-60 min	97	50,5
	60 min - 2 hr.	59	30,7
	2 - 4 more hr.	36	18,7

Data Instruments

Data instrument of this study is survey which consists of 4 sections which are demographic background, computer attitudes (20 items), computer experience (12 items) and self efficacy (15 items). The "computer attitudes scale (CAS)" developed by Selwyn (1997), "computer experience scale (SCES)"

developed by Yaghmaie (2007) and "computer self-efficacy scale" developed by Murphy et al.(1989). The original survey language was English and it was translated into Turkish. Translations were checked by the experts to in order provide that the translated items conveyed the same meanings.The Likert scale was used in the survey that comprised five points ranging from "strongly disagree'(1) to "strongly agree"(5).

Data Analysis

Data of the study were analyzed with SPSS program. T test and ANOVA were conducted to determine the differences between parametric variables. The significance level was accepted as .05

RESULTS

The first sub-question was defined as "Is there a significant differences between gender and computer attitudes,experiences, self efficacy of pre-service teachers?". T-test was used to determine If there is a meaningful stastisticaly gender differences with regard to computer attitudes, experiences, self efficacy. As a result of t- test analysis,there is no significantly gender difference between the three dependent variables

Table 2: T-test results differences gender and computer attitudes, experience, self efficacy.

	Gender	N	Mean	t	Df	Sig
Computer attitudes - Affective Component	Male Female	79 113	2,2582 2,4142	-1,714	190	,088
Computer attitudes - Perceieved Usefullness	Male Female	79 113	3,9595 3,8159	1,330	190	,185
Computer attitudes - Perceieved Control	Male Female	79 113	3,0612 3,0310	,502	190	,616
Computer attitudes - Behavioral Control	Male Female	79 113	2,5601 2,6040	-,448	190	,655
Computer Experience	Male Female	79 113	3,5293 3,4513	1,005	190	,316
Self Efficacy - Begining Skills	Male Female	79 113	3,6139 3,5619	,436	190	,663
Self Efficacy - Files and Software Skills	Male Female	79 113	4,2342 4,1327	,807	190	,421

*The mean difference is significant at the .05 level.

The second sub-question of the research was defined as "Is there a significant difference between ownership of personal computer and computer attitudes,experiences,self efficacy of pre-service teachers?". T- test was used to determine if there is a meaningful statisticaly differences between ownership of personel computer and attitudes, experiences,perceived self efficacy towards computer. There is no significantly difference between computer attitude, computer experience and ownership of personel computer. However, pre-service teachers who had personel computer, had significantly higher perceived self-efficacy in beginning skills ($t_{(190)}$=2.345,p<.05) and files and software skills ($t_{(190)}$=3.999,p<.05)

Table 3: T- test results of ownership of personal computer and computer attitudes,experiences,self efficacy

	Ownership of P.C	N	Mean	t	Df	sig
Computer attitudes - Affective component	Yes No	90 102	2,3756 2,3275	,533	190	,595
Computer attitudes - Perceived usefulness	Yes No	90 102	3,9022 3,8510	,479	190	,632
Computer attitudes - Perceived control	Yes No	90 102	3,0407 3,0458	-,084	190	,933

Computer attitudes - Behavioral control	Yes No	90 102	2,5444 2,6225	-,810	190	,419
Computer experience	Yes No	90 102	3,4909 3,4768	,184	190	,855
Self-efficacy - Beginning skills	Yes No	90 102	3,7278 3,4559	2,345	190	,020
Self-efficacy - Files and software skills	Yes No	90 102	4,4278 3,9510	3,999	190	,000

*The mean difference is significant at the .05 level.

The third sub-question of the research was defined as "Is there a significant difference between ownership of personal internet and computer attitudes, experiences, self efficacy of pre-service teachers?". T- test was used to determine if there is a meaningful statisticaly difference between ownership of personel internet and attitudes, experiences, perceived self efficacy towards computer. As a result of t-test, there is no significantly difference between ownership of personal internet and computer attitutes, computer experiences and computer self efficacy in beginning skills. However, there is a significantly higher difference in self efficacy-files and software with ownership of personal internet ($t_{(190)}$=2.468,p<.05).

Table 4: T- test results of ownership of personal internet and computer attitudes,experiences,self efficacy

	Ownership of P.I	**N**	**Mean**	**t**	**Df**	**sig**
Computer attitudes - Affective component	Yes No	93 99	2,3613 2,3394	,243	190	,809
Computer attitudes - Perceived usefulness	Yes No	93 99	3,9011 3,8505	,474	190	,636
Computer attitudes - Perceived control	Yes No	93 99	3,0771 3,0118	1,105	190	,271
Computer attitudes - Behavioral control	Yes No	93 99	2,5349 2,6338	-1,028	190	,305
Computer Experience	Yes No	93 99	3,5093 3,4591	,655	190	,513
Self -efficacy - Beginning skills	Yes No	93 99	3,6237 3,5455	,667	190	,506
Self- efficacy - Files and software skills	Yes No	93 99	4,3297 4,0286	2,468	190	,014

*The mean difference is significant at the .05 level.

The fourth sub-question of the research was defined as "Is there a significant difference between daily computer usage duration and computer attitudes, experiences, self efficacy of pre-service teachers?".The one way variance analysis (ANOVA) was used to determine if there is a meaningful statisticaly difference between daily computer usage duration and attitudes, experiences, perceived self efficacy towards computer. The results of ANOVA indicated that there is a significant difference between computer attitude (perceived usefulness) ($F_{(2,189)}$=3.748,p<.05), computer experience ($F_{(2,189)}$=5.693,p<.05), self efficacy (beginning skills) ($F_{(2,189)}$=8,241,p<.05), self efficacy(files and software skills) ($F_{(2,189)}$=15,878,p<.05) and daily computer usage duration.

Table 5: ANOVA results of daily computer usage duration and computer attitude, experience, self efficacy

		ANOVA				
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Computer attitudes - Affective component	Between Groups Within Groups Total	,052 74,188 74,240	2 189 191	,026 ,393	,066	,936
Computer attitudes - Perceieved usefullness	Between Groups Within Groups Total	3,966 99,994 103,960	2 189 191	1,983 ,529	3,748	,025
Computer attitudes - Perceieved control	Between Groups Within Groups Total	,472 31,555 32,027	2 189 191	,236 ,167	1,414	,246

Computer attitudes - Behavioral control	Between Groups	2,259	2	1,129	2,589	,078
	Within Groups	82,448	189	,436		
	Total	84,707	191			
Computer experience	Between Groups	3,039	2	1,519	5,693	,004
	Within Groups	50,446	189	,267		
	Total	53,484	191			
Self-efficacy - Beginning skills	Between Groups	10,080	2	5,040	8,241	,000
	Within Groups	115,586	189	,612		
	Total	125,667	191			
Self efficacy - Files and software skills	Between Groups	20,142	2	10,071	15,878	,000
	Within Groups	119,874	189	,634		
	Total	140,016	191			

*The mean difference is significant at the .05 level.

LSD test results show that there is a significant difference between participants daily use computer for 0-60 min, 60-120 and 120 min-more. Participants who use computer in 121 min-more in a day have higher computer attitudes (perceived usefulness) ($\overline{x}$ =4, 14) than those who use 0-60 min. ($\overline{x}$ =3, 75) and 60-120 min. ($\overline{x}$ =3,90) a day.

Table 6: LSD test results-computer attitudes (Perceived usefulness)

Computer attitudes – Perceived Usefulness

Group	0-60 Minute	60-120 Minute	121- more minute
A	-	-,14293	-,38568*
B		-	-,24275
C			-

*The mean difference is significant at the .05 level.

Table 7: LSD test results-computer experience

Computer Experience

Group	0-60 Minute	60-120 Minute	121- more minute
A	-	-,16662	-,32584*
B		-	-,15922
C			-

*The mean difference is significant at the .05 level.

Participants who use computer in 121 min-more in a day have more experience ($\overline{x}$ =3,69) than those 0-60 min. ($\overline{x}$ =3,37) and 60-120 min. ($\overline{x}$ =3,53) a day

Table 8: LSD test results- self efficacy – (beginning skills)

Self-Efficacy-Beginning Skills

Group	0-60 Minute	60-120 Minute	121- more minute
A	-	-,14512	-,61899*
B		-	-,47387*
C			-

*The mean difference is significant at the .05 level.

Participants who use computer in 121 min-more in a day have higher self-efficacy (beginning skills) ($\overline{x}$ =4,04) than those 0-60 min. ($\overline{x}$ =3,42) and 60-120 min. ($\overline{x}$ =3,56) a day.

Table 9: LSD test results- self-efficacy – (files and software skills)

Self-Efficacy - Files and Software Skills

Group	0-60 Minute	60-120 Minute	121- more minute
A	-	-,57310*	-,74275*
B		-	-,16965
C			-

*The mean difference is significant at the .05 level.

Participants who use computer in 121 min-more in a day have higher self-efficacy (files and software skills) ($\overline{x}$ =4,60) than those 0-60 min. ($\overline{x}$ =3,85) and 60-120 min. ($\overline{x}$ =4,43) a day.

CONCLUSION

This study investigated self-efficacy, experience, attitude of pre-service social studies and mathematics teachers' relations of socio demographic characteristics towards computer. The results showed that there is no difference between male and female pre-service teachers' attitudes, self-efficacy and experience towards computer. Generally, people who had personal computers and internets, there are no differences in their attitude, self-efficacy and experience towards computer. There is a significant difference between computer attitude (perceived usefulness), computer experience, self efficacy (beginning skills) and self efficacy (files and software skills) in terms of daily computer usage duration. According to LSD test results, when daily computer usage duration of people is increased, their attitudes,experience, and self efficacy towards computers are rised as well.

This research is restricted with 192 pre-service teachers from elementary mathmetics and social studies education in Education Faculty.We can recommend that this research can apply to teachers and instructors. Also, the another dimension of computer anxiety can be added for the next researches.

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PRESERVICE TEACHERS' USAGE OF DYNAMIC MATHEMATICS SOFTWARE

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Abstract : Aim of this study is about mathematics education and dynamic mathematics software. Dynamic mathematics software provides new opportunities for using both computer algebra system and dynamic geometry software. GeoGebra selected as dynamic mathematics software in this research. In this study, it is investigated that what is the usage of preservice mathematics teachers for teaching and learning mathematics concepts. Quantitative and qualitative research methodologies were used in this study. First participants learned basic commands about GeoGebra. During lessons preservice teachers of mathematics used dynamic worksheets. Data were collected by participants' works and opinions on dynamic mathematics software. According to responses of participants, preservice teachers want to use dynamic mathematics software for teaching mathematical concepts. Their works on GeoGebra showed that participants want to offer interactive dynamic mathematics worksheets on internet to the students. for mathematical concepts.

Keywords: dynamic mathematics software, mathematics teaching, mathematics learning

Introduction

Understanding the factors about teachers' use of technology for teaching and instructional purposes is important (Teo,2009). Teachers' usage of computer depends on their knowledge and experience about technology. Teachers integrate technology for teaching in different ways such as presentation purposes or allowing students to use a full range of technology resources (Teo,2009). According to content of teacher education programs, preservice teachers can be able to use technology for educational purposes. Şahin and Toy (2009), reported that student-centered teaching methodology, expertise in computer use, and a high level of technology integration in teaching expressed more preservice teachers' positive attitudes toward using computer applications for instructional purposes.

On the other hand, preservice teachers of mathematics need to improve technological skills in order to use Information and Communication Technologies (ICT) in classrooms. Programs for teacher preparation in Turkey have computer courses. Preservice teachers are able to learn basic commands and usage about operating systems, word processing, presentation preparation, internet. However, preservice teachers must know how to use ICT for teaching and learning.

Also, mathematics curriculum emphasize on using dynamic geometry systems (DGS) for teaching geometry concepts (MoNE,2006). For this reason, teachers should learn use DGS in mathematics classrooms. According to curriculum reform in Turkey, students' role and teachers' role has changed (Bulut,2007). Mathematics teachers must know usage of DGS for preparing lesson activities with it. So, some courses about using DGS offered to preservice teachers of mathematics in Gazi University. During these lessons, they can learn both how to use DGS and how to develop dynamic worksheets with DGS.

Computer Algebra Sytems (CAS) improve students' conceptual understanding and problem solving abilities(Aksoy et al 2007,Bulut et al 2007). Dynamic mathematics software offers opportunities for using both computer algebra system and dynamic geometry software (Hohenwarter et al,2009, Hohenwarter & Lavicza,2009). Preservice teachers of mathematics need applications of dynamic mathematics software during learning and teaching mathematical concepts (Jones,K ,2009).

In this study, it is investigated that what is the usage of preservice mathematics teachers for teaching and learning mathematics concepts. Because of facilities of GeoGebra, it was selected as dynamic mathematics software in this research.

The Study

Quantitative and qualitative research methodologies were used in this study. First 47 second year student participants learned basic commands about GeoGebra. During lessons preservice teachers of mathematics used dynamic worksheets. Data were collected by participants' works and opinions on dynamic mathematics software. Interviews administered to randomly selected participants.

Findings

According to responses of participants, preservice teachers want to use dynamic mathematics software for teaching mathematical concepts. There are some intercepts from interviews:

Preservice teacher of mathematics(PTM-1) stated that: *"...Mathematical proofs can be learned easily by using Geogebra. Students can discover relationships between mathematical concepts through different types of representations such as geometric,algebraic and graphical..."*

PTM-1 preferred to construct geometric figures and prove with dynamic worksheets as shown below:

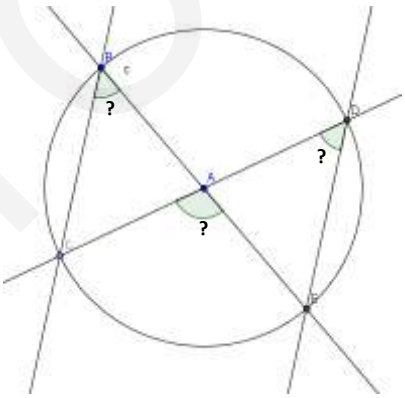

Figure.1. Investigation of relationship between angles in a circle by using GeoGebra

Their works on GeoGebra showed that participants want to offer dynamic mathematics workheets on internet to the students. Participants learned basic commands of GeoGebra during lessons. After that they prepared activities for mathematical concepts. Their dynamic worksheets on internet were interactive learning environment for learners.

There some examples from preservice teachers' works:

According to Figure.2 preservice teachers can produce geometric tessellations and mathematical patterns using dynamic mathematics software instead of paper and pencil. PTM- 2 stated that:

"...I can draw what I need by using GeoGebra. I do not use paper or rubber while using dynamic mathematics. I think my students will learn and build these patterns easily..."

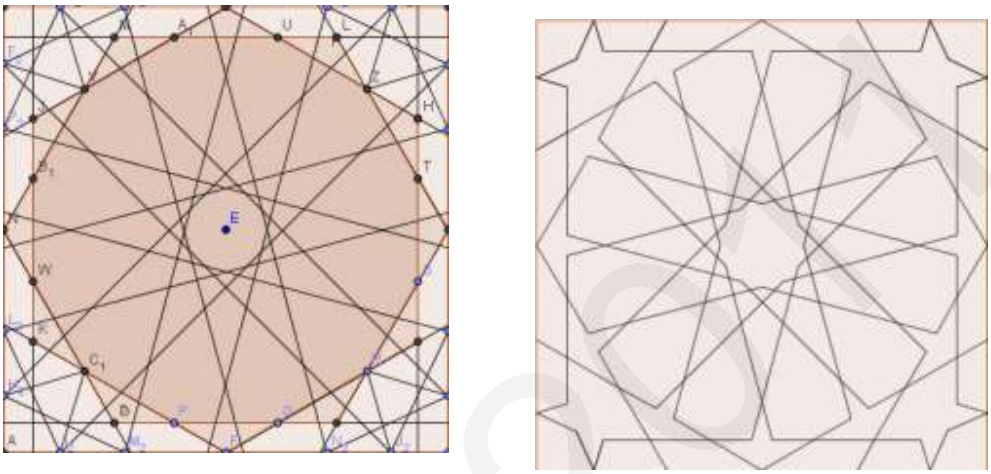

Figure.2 PTM-2's work for geometric tesellation(12-armed star-historical shape in Turkish architect)

PTM-3 was used other materials pictures such as Turkish patchwork for teaching geometric concepts in primary mathematics such as rotation, symmetry, translation and reflection. PTM-3 stated that:*"...I am looking everywhere by mathematical point of view. I can adopt real situations and images to Geogebra. In my opinion, geometry should be thought by using GeoGebra..."*

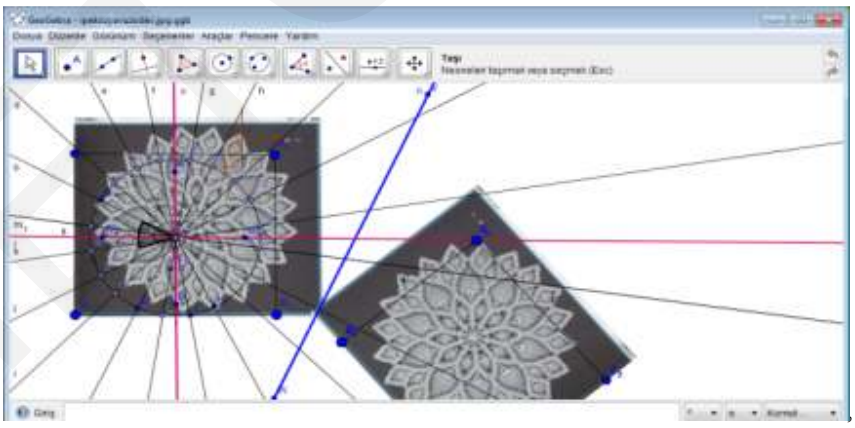

Figure-3: PTM-3's work about symmetry, rotation, translation and reflection

Some preservice teachers used GeoGebra for establishing real life examples with an international perspective from all over the world. For this reason PTM-4 was used a stadium picture from Riyad and PTM-5 was used Pisa tower. PTM-4 stated that:

"…GeoGebra enables using real-life examples for teaching and learning mathematical concepts. During preparation of worksheets I investigate interesting buildings from different cutures and countries. Their common point is usage of mathematics in life…"

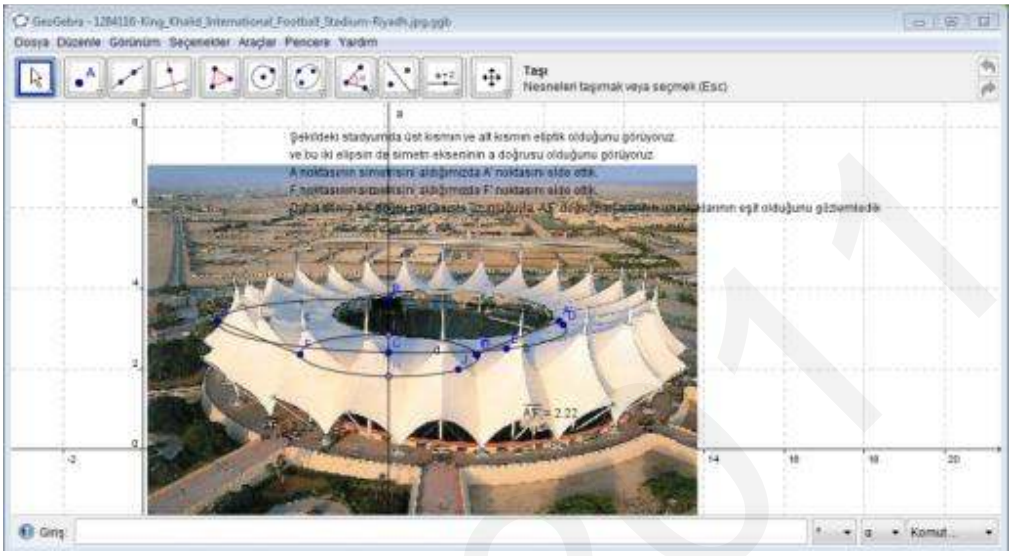

Figure 4.PTM-4's real- life example from Riyad

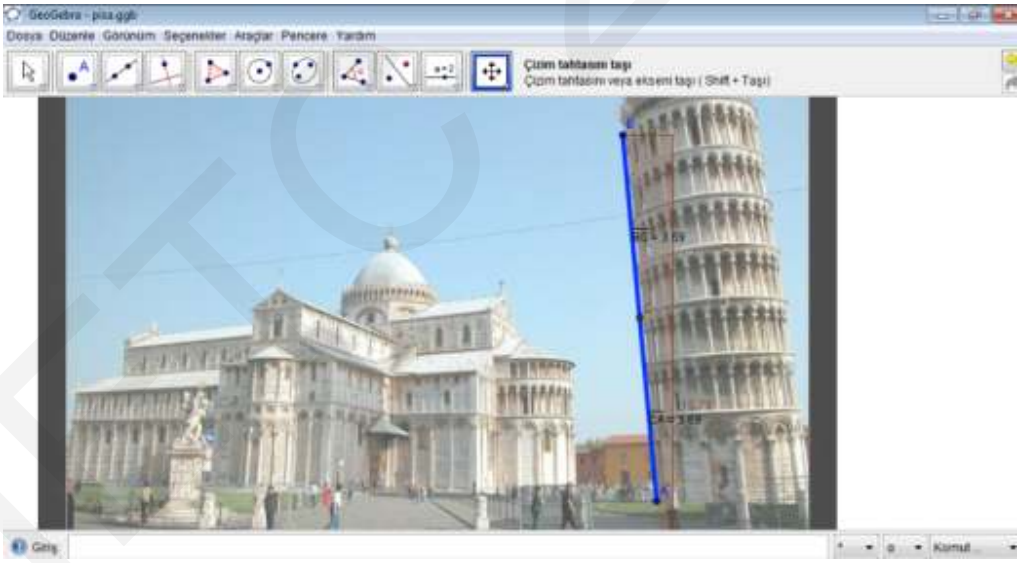

Figure-5. PTM-5's real life example from Pisa tower.

PTM-5 stated that:*"…I can do problem posing by using real examples from touristic places. So I can interrelate my lesson with social studies or other disciplines. According to math curriculum, interdisciplinary approach should be used during teaching of math, so I think it is useful to develop activities by using GeoGebra…"*

GeoGebra offers web-publishing opportunities for mathematics education. Some of PTMs were used these tools for building interactive web pages. PTM-6 and PTM-7 created dynamic worksheet web-pages for teaching mathematics. PTM-6 stated that :

"...In nature, there are some examples of mathematical subjects like fractals and its If I publish these webpages to internet my students can enter whenever they want and they can discover by trying each time. This website was an interactive learning environment for learners of mathematics..."

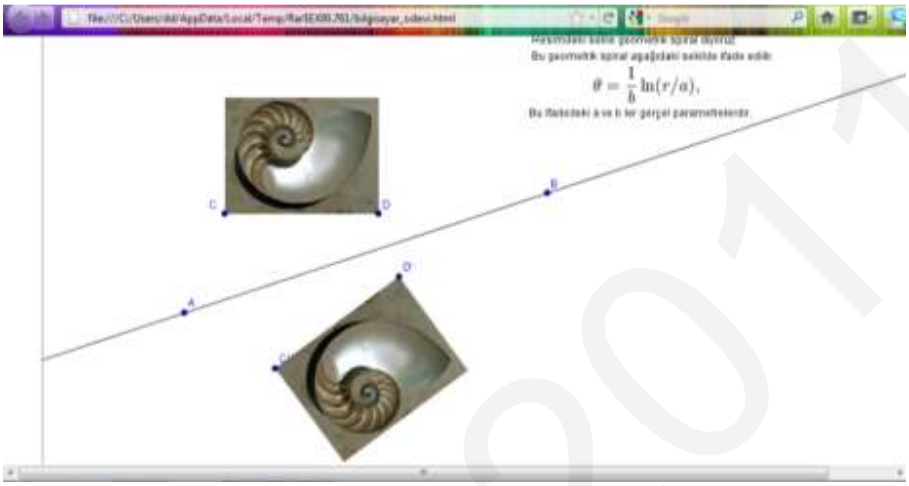

Figure-6.PTM6's interactive dynamic worksheet extracted from GeoGebra as a website.

PTM-7 said that: "…most important part is discovering concepts both in Algebra and Geometry windows in GeoGebra…."

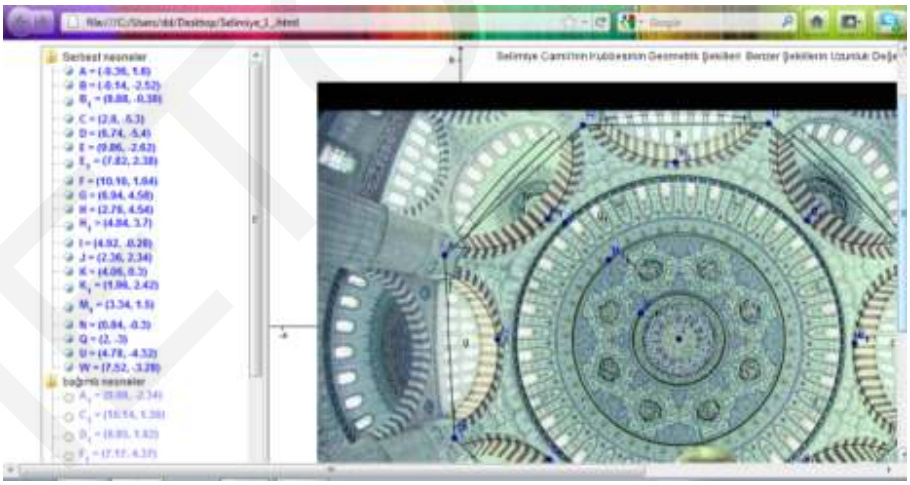

Figure-7.PTM-7's interactive dynamic worksheet extracted from GeoGebra as a website.

Conclusions

In spite of most of the PTMs (%97) were using successfully basic computer facilities and %88 of them know basic commands of GeoGebra %65 of them stated that they were able to design web pages with Geogebra applications for interactive dynamic worksheets. %73 of PTMs preferred to use integrate pictures

to background of worksheets for connect geometry to real life examples. Others preferred just for writing exam questions(%12),building web pages(%8), calculating algebraics(%7). Findings revealed that, PTMs want to use technology with real examples in a discovery-based learning environment. By conclusion, it was a little step for PTMs but a big step for mathematics teaching and learning according to responses.

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PRESS THE BIG BLUE BUTTON TO TEACH COMPUTER SCIENCE

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Abstract: Students of the undergraduate course Introduction to Informatics get acquainted with computer architecture, operating system, computer network and data encryption in history as well as with up to date applications. During the consultation hours the students have the opportunity to ask the problematic questions to understand the learning material that they can download after the presentations. The experiences show the students wait for the last day before the test to download and learn the learning matherial and they do not use the opportunities of the consultation hours. Usually there are just 1 or 2 students coming to ask questions at this time. BigBlueButton is an open source web conferencing system and the students in the first semester could use it to ask the problematic questions from home. The experiences show this way of consultation is near to students' habit and helps them to understand the learning material better and score a higher paper mark.

keywords: Experience, BigBlueButton, using Computer Science Education

INTRODUCTION

I teach the students of the undergraduate course Introduction to Informatics of The Bánki Donát Faculty of Mechanical and Safety Engineering at Óbuda University. This Faculty has three majors: Mechanical Engineering, Safety Engineering and Mechatronic Engineering. In the first semester the students learn about computer architecture, computer virus, logical operations and computer network, this is what I am analysing in this article. I composed this learning material on the basis of the results of an analysis of the entering students' knowledge level (Kiss, 2008) (Kiss, 2009a) (Kiss, 2009b). My goal is to teach the learning material always with a better result so I try to use alternate tools to reach this goal. I have reached some results in the second semester when I teach the most prevalent methods of data concealment (steganography) and data encryption in history as well as with up to data applications (Kiss, 2005) (Kiss, 2010a) in this course. I wrote some computer programs to show up to date steganographic (data concealing) methods using picture and sound files, demonstrating how to use and deciphering the Ceasar code, monoalphabetic encryption and its deciphering. Another program demonstrating the Vigenére encryption continuously shows which rows and columns are used in the process. To illustrate the Cardano grid a program was written, which prepares a rotatable grid adequate to put the characters of the message to the appropriate place in the grid in order to conceal it (Kiss, 2010b) . Unfortunately these ideas were not enough to solve the problem of the learning habits of students (Kiss, 2009c). Students have been downloading the teaching material of Introduction to Informatics from a web based system since 2007. The learning material is accessible in the system just after the presentations, on the same day. By analysing the data of the first semester I tried to find a relationship between the time of download and the result of the papers written by the students. Most of students downloaded the teaching material on the day of the test or the previous day (Kiss, 2010c). The students always have the chance to come up to me after the presentation to ask questions if they have problems with some part of the material or if they could not understand something, but just a few students use this way. I have consultation hours every week when the students can come to my office to make the problematic questions clear, but only 3 or 4 students come at this time. We always hear that young people continuously sit at the computer surfing the Internet or visiting a facebook or other websites (Victory, Cooper, 2002). I want to find a tool to reach the students at home before the computer to make the consultation in this way (Oblinger D., Oblinger J., 2005). I think it might have more visitors. This way will show the students more activity to ask the problematic questions and they will get better paper results. This is my starting hypothesis.

BIGBLUEBUTTON THE OPEN SOURCE WEB CONFERENCING SYSTEM

I have heard about the BigBlueButton open source web conferencing system and I thought I should try it in Computer Science Education as a consultation tool. In this system the teacher can upload any PDF presentation or office document and keep everyone in synch with their current page, zoom, pan, and see the teachers mouse pointer. The users can share their webcam at the same time without limit on the

number of simultaneously active webcams. The teacher can broadcast their desktop for all students to see (figure 1.). The system supports voice over IP (VOIP) conferencing, all students need speakers and a microphone to participate („BigBlueButton", 2011).

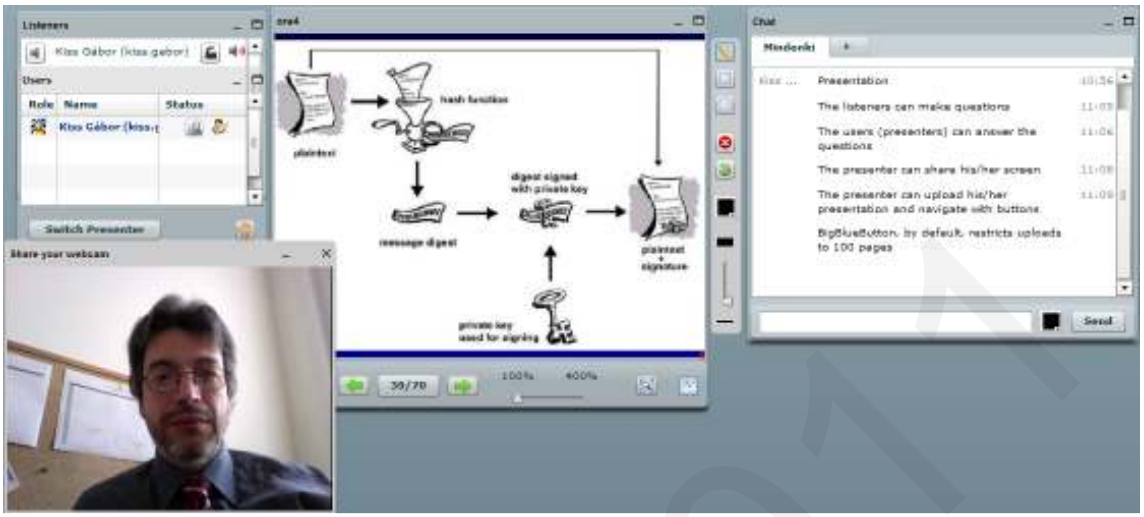

Figure 1. Desktop of BigBlueButton

Our server can serve 40-50 users at the same time so it was the limit of participants in a consultation. I teach more than 500 students so I organised 1-2 all day webconsultation opportunities for the students.

ANALYSING OF THE PAPER RESULTS BY SPECIALIZATION

The Number of Participantst in the First Test in the Two Groups and the Values of Mean and Std. Deviation

The students have to write two papers in a semester to show how they can learn the learning material. I analysed the paper results of the students after the first semester and made two groups. The students who used web based consultation from week to week to ask the problematic questions in connection with the learning material were in the first group (group A) while the students who did not take part in any web consultations were in the second group (group B).
According to the table (Table 1.) the mean of the results of first papers of group A is higher. It means this group wrote the papers with a better result. It does not give enough information to say using of web conferencing results in better written tests because this can happen accidentally, too. So, we needed more analyzing to keep the chance of accident low.
If we spend more time to look at this table, we can see ~25% of the mechanical engineers and safetytechnic engineers took part in web consultations and the bigger part of the students did not. We can see the students who used the opportunity of web based consultations could pass the test in higher percent, but we still do not know if it is an accident or not.

Table 1.
Group statistics of first tests results by specialization

Specialization	Group	Number of participants	Mean	Std. Deviation	Pass the test
Mechanical Engineer	A	85	1,847	0,8998	55,29%
	B	280	1,707	0,7760	22,14%
Safetytechnic Engineer	A	24	1,758	0,8720	59,55%
	B	89	1,729	0,7076	45,83%
Mechatronic Engineer	A	31	2,323	1,0372	77,41%
	B	50	1,550	0,6247	48%

Independent Samples test of First Papers by Specialization

My null hypothesis was that the results of the first paper written by the two groups of students would not differ significantly. Since we have two independent samples, we can use the T-test to tell if the means of the first paper of these groups differ or not (Table 2.).

Table 2.
Independent sample test of first paper results by specialization

Specialization		Levene's test for Equality of variances		T-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed
Mechanical Engineer	Equal variances assumed	1,683	0,195	-1,401	363	0,162
	Equal variances not assumed (Welch's t-test)			-1,295	124,299	0,198
Safetytechnic Engineer	Equal variances assumed	4,995	0,027	0,171	111	0,865
	Equal variances not assumed (Welch's t-test)			0,151	31,631	0,881
Mechatronic Engineer	Equal variances assumed	7,040	0,01	-4,190	79	0,000
	Equal variances not assumed (Welch's t-test)			-3,747	43,662	0,001

An analysis of the results of mechanical engineers („Levene's test", n.d.) showed the variance of the two groups are not different, because the value of Levene's test is not significant ($p<0,05$) (Levene, 1960).
In this case the means could be compared with T-test („Student's t-test", n.d.) which did not show up a difference between the means, because the value of T-test is not significant ($p<0,05$). It means the using of webconsultation did not have influence on the results of first papers of mechanical engineers.
The analysis of the results of the safetytechnic engineers („Levene's test", n.d.) showed the variance of the two groups is different, because the value of Levene's test is significant ($p<0,05$). In this case the means could be compared with Welch's t test („Welch's test", n.d.) (Welch, 1947). This did not show difference between the means, because the value of Welch's t test is not significant ($p<0,05$). The safetytechnic engineers did not gain advantage of using web based consultation at the first papers results.
The situation is different with the mechatronic engineers. We can see the means of the first paper by this specialization differ mostly. The analysis of the result (Levene test) showed the variance of the two groups are different because the value of Levene's test is significant ($p<0,05$).
In this case the means could be compared with Welch's t test. This showed difference between the means of the results of the students attending the web based consultations were one mark better than the results of the other group where the students had not taken part in these consultations. It means these students could take advantage of using BigBlueButton web conference system.

Measures of Association by the First Paper Results

Earlier, no significant differences could be detected between the means of the first papers by specialization mechanical and safetytechnic engineers just at the mechanical engineers. It means it is profitable to make deeper analysis just of the mechanical engineers to reveal the influence of the web based consultation on the calculated means. I could reveal the influence with the calculation of the Eta-squared (η^2) („Analysis of variance", n.d.). The calculated value in percentage shows how much grouping influences the difference between means. Square root from the Eta-squared gives a value between 0 and 1 (η). This shows the measures of association, i.e. how strong the connection between grouping and the achieved result is. The higher the value is, the stronger the connection is (Cohen, 1973). In the next table we can see the calculated values and the strength of the connection (Table 3.).

Table 3.
How strong the connection between grouping and the achived first paper results

Specialization	η^2	η	Strength of the association
Mechatronical engineer	18,2%	0,426	middling weak connection

Calculating the Eta-squared I tried to make the effect of the web based consultation on the result of the first papers written percentable and got a surprising 18,2%. This means there is a middle weak correlation

existing between the using BigBlueButton web conference system and the results of the first papers written by the students. It seems the students of the other two specializations could not take advantage of using webconsultation before the first paper. The next step is to analyse the results of second paper because more students used BigBlueButton before the second test than earlier.

The Number of Participants in Second Test in the Two Groups and the Values of Mean and Std. Deviation

According to the table (Table 4.) the mean of the results of the second papers of group A is higher again, just like at the first test, but the difference is bigger than earlier. We can see passing the test also shows a higher percentage. This means the students who have taken part in web consultations have more chance to pass the test; higher percent of students of group A could pass the test. We can recognize another change at the values of the second test too, ~ 50% of the mechanical and safetytechnic engineer students used BigBlueButton before the second test to ask the problematic questions. It was just 25% before the first test. It means the students knew this system and gladly used this opportunity in the second half of the semester. The majority of the students needed more time to get to know the new tools to use them. The mechatronical students could take advantage of it right at the first paper, but these studentst have the best skill to learn the learning material of every subject in this Faculty at the Óbuda University. We needed more analyzing to keep the chance of accident low like at the first test.

Table 4.
Group statistics of second tests results by specialization

Specialization	Group	Number of participants	Mean	Std. Deviation	Pass the test
Mechanical Engineer	A	176	1,95	0,719	73,30%
	B	189	1,51	0,600	44,44%
Safetytechnic Engineer	A	61	1,81	0,620	68,85%
	B	52	1,52	0,602	46,15%
Mechatronic Engineer	A	52	2,21	0,743	84,62%
	B	29	1,31	0,471	31,03%

Independent Samples Test of Second Papers by Specialization

My null hypothesis was that the results of the second paper written by the two groups of students would not differ significantly. We can use the T-test to tell if the means of the second paper of these groups differ or not (Table 5.).

Table 5.
Independent samples test of second papers results by specialization

Specialization		Levene's test for Equality of variances		T-test for equality of means		
		F	Sig.	t	df	Sig. (2-tailed
Mechanical Engineer	Equal variances assumed	2,075	0,151	-6,375	363	0,000
	Equal variances not assumed (Welch's t-test)			-6,334	341,779	0,000
Safetytechnic Engineer	Equal variances assumed	0,923	0,339	-2,530	111	0,013
	Equal variances not assumed (Welch's t-test)			-2,536	109,116	0,013
Mechatronic Engineer	Equal variances assumed	2,003	0,161	-5,894	79	0,000
	Equal variances not assumed (Welch's t-test)			-6,668	77,610	0,000

An analysis of the results by specialization (Levene test) showed the variance of the two groups are not different because the value of Levene test is not significant ($p<0,05$).
In this case the means could be compared with T-test by all specialization which showed up a difference between the means, because the value of T-test is significant ($p<0,05$). It means the using of web based

consultation has influence on the results of second papers by all specialization. It means these students could take advantage of using BigBlueButton web conference system, but we need more analysing to reveal the influence on them.

Measures of Association by the Second Paper Results

We could detect significant differences between the means of the second papers by all specialization. It means we can reveal the influence by specializations of the web based consultation on the calculated means with the calculation of the Eta-squared (η^2). The calculated value in percentage shows how much grouping influences the difference between means and the square root from the Eta-squared (η) shows the measures of association, i.e. how strong the connection between grouping and the achieved result is. The higher the value is, the stronger the connection is. In the next table we can see the calculated values and the strength of the connection (Table 6.).

Table 6.
How strong the connection between grouping and the achived second paper results

Specialization	η^2	η	Strength of the association
Mechanical engineer	10,1%	0,317	weak connection
Safetytechnic Engineer	5,5%	0,234	weak connection
Mechatronical engineer	30,5%	0,553	middling strong connection

According to the table (Table VI.) the calculated value of Eta-squared shows the effect of the web based consultation on the result of the second papers is percentable. We can see the strength of association at the mechanical and safetytechnical engineers show weak connection. This means the students from these two specializations have learned to take advantage of the web based consultation test and more of them used this tool too before the second test than before the first one when we found no connection. It seems these students need more time to recognise the advantage of this tool. Earlier, before the first test, we could see a middle weak correlation existing between the using BigBlueButton web conference system and the results of the first papers written by the mechanical engineer students. The situation changed in this case, too. These students could take more advantage of using webconsultation before the second paper. The value of Eta-squared is 30,5%, this means a middle strong correlation exists between the using BigBlueButton web conference system and the results of the second papers written by the mechatronical engineer students.

Conclusion

We can say after the analysing process my starting hypothesis is correct; students get better paper results by using web consultation system. Moreover we have to mention that the effect of using web based consultation system was different by specialization. The mechatronical engineer students could take advantage of this tool before the first test, the mechanical and safetytechnic engineer students needed more time to recognize the advantage. We can see this difference in the number of participants by tests and specialization. Before the first test used just ~25% of students this opportunity to make consultation before the second test the number of participants growed spectacularly. The students could get a half mark better paper results when they used this tool to ask the problematic questions before the test. They took part in consultations from home in this way more gladly than personally coming to the office in this time. The web based consultation is a good way to catch the students who have problems with the learning material but they do not have enough courage to ask questions. BigBlueButtom fills up this gap between the students and the teacher.

Future work

Earlier we could see the using of this tool shows difference between the students by specialization. I would like to find the reasons so I need to make more analysis after the second semester. We might see a growing use of BigBlueButton, maybe it will continue in the second semester, too and I can find the same strong connection between using BigBlueButton web conference system and the results of the papers.

Summary

According to the starting hypothesis exposed in the introduction students who use web based consultation system will get better paper results. The analysis of the test results showed the students who used this tool got better marks, so the original hypothesis was correct. Some students needed more time to learn to use BigBlueButton or understand the advantage of this tool, but the bigger part of the students used it before the second test and got better paper results. We can declare the use of web based consultation system is useful for students and teachers as well, because it is easier to clear the problematic questions in connection with the learning matherial this way.

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THE RELATIONS BETWEEN LEARNING STYLES AND DECISION-MAKING STYLES OF STUDENTS

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ABSTRACT

The learning styles of an individual may affected the way of living within the social environment. During the socialization process individual learns how to act, react, response or buy the products, services or ideas. Through this study the students' learning styles were explored to understand their styles of learning and examined if those styles related with the decision making styles of them. The questionnaire was applied to collect the data which was administered to the university students in Famagusta, North Cyprus used the Sproles and Kendall's Secondary Learning Style Inventory (SLSI) and Consumer Style Inventory (CSI) as the tools. Based on the research, six decision-making styles and three learning styles were identified and analyzed. It has been found that the majority of students was active practical learners and had a highest positive correlation with the price consciousness style. Thus the positive correlations were found between learning styles and consumer decision-making styles.

Keywords: learning styles, factor analysis, consumer-decision making styles, North Cyprus

INTRODUCTION

Each individual learn the way of being a person or act in his/her socialization process of his/her life. The learning process starts from the time of new baby till the end of his/her life. People learn how they are accepted by the society in their lives during the socialization process. Each person can be seen as individuals, learners, students, consumers and so on in their lives.

The individuals are the consumers who consume many goods and services in their daily lives. Thus the learning styles of people show some typical changes on their consumption decision making process. Furthermore, the learning styles of individuals give some feedback about the way of thinking, acting, believing or learning the topics.

Sproles and Kendall (1990) mentioned that, those years the individual approaches for learning as seen a new way of analyzing the individuals' learning styles. According to them, there was a significant relationship available among people's learning and consumer decision making styles. Sproles (1986), Sproles, Cox, Sproles (1988), Sproles and Kendall (1986) (1990) used Secondary Learning Style Inventory (SSLI) and they indicated that the roots of SSLI based on Kolb's learning theory.

Considering that it is important to focus on the learning styles of Turkish students to explore their styles topic, to understand how the students' minds operate during the learning process, hence this paper aims to find out the relation between students learning styles and decision making styles of Turkish university student in North Cyprus.

Kolb's Experiential Learning Theory (ELT)

Kolb (1984) emphasized that, experiential learning directed for learning through experiences in one's lifetime. According to Kolb, learning is "the process whereby knowledge is created through the transformation of experience" (Kolbö 1984). Kolb, Boyatzis, Mainemelis (2001) emphasized that Kolb's Experiential Learning Theory (ELT) had four stages which two of them focused on experience that were Concrete Experience (CE) and Abstract Conceptualization (AC), and two of them were focused on transformation of the experience as Reflective Observation (RO) and Active Experimentation (AE).
Sproles and Sproles (1990) explained the learning style as "the way each person absorbs and retains information's and/or skills" (p.137). Generally, the scholars who interested in consumer education agreed

that their decision making was based on a process of learning. The learning styles of students give the information about how their minds were managed during the learning process. (Omar, Ali, Hussin and Rahim, 2009)

Leaning Styles as Individual learning styles

According to Cox and Sproles (1988) "Each learner possesses an individual learning style, which is preferential mode of learning. Learning styles may be described many ways, much as individual personality is characterized by psychologists into "personality characteristics". (p.1) Thus the explanation of learning styles seemed as new for education in 1990s.

Sproles and Kendall (1986) found out Secondary Learning Styles Inventory that covers six learning styles as serious- analytical learner, active-practical learner, observation-centered Learner, concrete, detail, fact-oriented learner, Passive-accepting learner and non- passive, struggling learner. They were to use SSLI and applied about 482 students to test their inventory in 1986. Sproles, Kendall and Cox (1987) used SSLI with 2000 students as a sample and tested validity and reliability of the inventory. They examined that these learning styles were the preferred learning styles of students. They found out that 75% of respondents prefer "active, practical learner".

In 1990, Sproles and Sproles found out that there was a relationship exists among the students' preferred learning styles and consumer decision making styles. They declared that "consumer decision making styles as a function for individual learning styles." Thus, they dealt with the "individual learning styles" affected the students' decision making styles during the consumption. The few studies focused on the learning styles of individuals which based on their studies of Sproles and Kendall (1990), the consumer decision making styles were "a function of individual learning styles" **.**

Sproles and Kendall (1986) had developed a SLSI of 23 items for discovering the students' learning styles. It was based on Kolb's theory which was focused on adult people. However, Cox, Sproles and Sproles (1988) focused on younger people as a sample and found out some additional characteristics. There is analytic validity of six factors as basic characteristics of learning styles as follows;

(1) Serious, Analytical Learner, is a style considering the students prefer to think logically, rationallly and cearefully during the learning process. They like to have new ideas and things and complex things to work on topics.

(2) Active, Practical Learner, is a style that the students think that "doing things" is their preference during the learning process. They prefer real practices, cases and experiences during the learning. They like practical applications instead of theorical things. They think that when they excited they learn the things better.

(3) Observation Centered Learner, is a style of students that they like observation and waching others a way of learning during any activity.

(4) Passive, Accepting Learner, is a style that the students keep their silence in the classroom and they accept everything come from instructors.

(5) Concrete, Detailed, Fact-Oriented Learner, is a style that the students focus on subject by dividing them into smaller sections. They like to take notes and prefer detail facts.

(6) Nonadaptive, Struggling Learner, is a style that the students feel themselves doubtful and insecure and they think they have a intutive side of learning.

Consumer Decision Making Styles

Sproles and Kendall (1986) have developed a CSI of 40 items for discovering the consumer decision making styles. There is analytic validity of eight factors as basic characteristics of consumer decision making styles as follows;

(1) Perfectionistic, High-Quality-Conscious Consumer, is a feature considering the degree of consumers' search for best quality for the products in the market available.

(2) Brand-Conscious, Price-Equals-Quality Consumer, is a feature assessing the consumer's inclination towards expensive and reputable products and brands.

(3) Novelty- and Fashion-Conscious Consumer, is a feature of consumers who are open to new offerings and achieve pleasure through possesion of innovative products.

(4) Recreational and Shopping-Conscious Consumer, is a feature that tests the extent of the consumer to view shopping as a fun and leisure activity.

(5) Price-Conscious, Value-for-Money Consumer, is a feature noticable with high price conscious consumers in terms of sales and cheap prices.
(6) Impulsive, Careless Consumer, is a manner of consumer type who are less attantive and spontaneous at their purchases without considering how much they spend.
(7) Confused by Overchoice Consumer, is a consumer category confused by the numerous products and brand offerings in the market and gets exhausted by it.
(8) Habitual, Brand-Loyal Consumer,, is a consumer category with repeated purchases of his/her same favourite brands and shops habitually.

METHODOLOGY

For the current study, factor analysis as a quantitative methodology was used to explore the styles of students. The study was conducted at the Eastern Mediterranean University (EMU). For an exploration to identify the determination of students' learning style and decision making style formats, exploratory factor analysis used to analyze with principle component method with varimax rotation for each factors and reliability analysis construct the validity of each factor. Also, cluster analysis confirm that the number of cases as students available in each cluster. Pearson correlation and Independent Samples T-Test were used to measure the strength of the correlation among the dependent and independent variables. Learning styles was used as independent variables and decision making styles were used as dependent variables.

The Objectives of the Study

The current research study aimed found out the answers of these following research questions:

- Which learning styles do the Turkish university students have?
- Which consumer decision making styles do the Turkish university students have?
- Is there any relationship exist among their learning and decision making styles?

SAMPLE AND DATA COLLECTION

Data was collected through samples formed by random sampling methodology with the usage of SLSI and CSI. A questionnaire survey was conducted to collect the data for the research and was administered to 300 university students at Eastern Mediterranean University. Only 274 university students filled the questionnaires correctly as 122 males and 152 females with as a sample 95% confidence level. Ten demographic questions, twenty three items of SLSI and forty items of CSI were asked to the university students.

In this study, 5-point Likert scale was used and implemented in order to collect data for the data analysis. In the scale, the respondents were asked to state their level of agreement on each statement as (1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree, 5=Strongly Agree). The questionnaires were translated into Turkish as the native language or mother tongue of the respondents.

ANALYSIS OF FINDINGS

Analysis for Learning Styles

For values of KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) were higher than acceptable point of 0.50. (KMO, 0.923 > 0.50) and Bartlett's Test of Sphericity was significant. (KMO: 92%, Barlett: 2452.71, df: 120, $p < 0.001$). The students' learning styles were 63.524% of variance and a range of eigenvalues of 1.076 to 7.523 that eigenvalues were greater than 1 as shown in Table 1.From the table 2, factor loading for each learning style computed and three learning styles were reliable for this study.

Table 1 Reliability of students' learning style factors and variance

Factors	Number of items	Eigen values	%of variance explained	Coefficient Alpha
Serious Analytical Learner	6	7.523	29.314	$\alpha = 0.91$
Active, Practical Learner	5	1.565	17.451	$\alpha = 0.87$
Observation Concrete Detail Passive learner	5	1.076	16.758	$\alpha = 0.73$
Total Variance explained			**63.524%**	

According to the table 2 analysis, students have three types of learning styles. 89% of the students were Active Practical learner. Serious Analytical learners prefer to think carefully and logically. They prefer new ideas to work on seriously. Active Practical learners prefer real cases and practices. They learn better with real experiences and practical applications. Observation Concrete Detail Passive learners prefer to

observe the other people. They think that writing the notes and listening in the classroom was their preferred way of learning. A degree of passive learning was available and they prefer to look at details during the leaning.

Table 2 Factor Analysis of Learning Styles

Learning Style Characteristics Statements	Factor Loadings	Mean Value
Factor 1 Serious Analytical Learner	**α = 0.91**	**4.17**
Careful and logical thinking is what I value in learning.	0.81	4.23
Thinking things carefully and rationally is what I like.	0.81	4.11
Putting new ideas and thoughts together id enjoyable for me.	0.78	4.26
Hearing new ideas and facts is what I like.	0.77	4.33
Making wise decisions and thinking through difficult things is enjoyable.	0.71	4.10
Serious thinking and looking back what I learn is my way.	0.67	4.02
Factor 2 Active, Practical Learner	**α = 0.87**	**4.11**
Learning through actual practices is preferable to theories for me.	0.69	4.13
Through actual experience and subject practices I learn more.	0.67	4.13
Experimenting and seeing how things work is enjoyable.	0.64	3.86
My preferred way of learning is to do things actually.	0.59	4.27
Practical and useful activities teach me well.	0.58	4.15
Factor 3 Observation Concrete Detail Learner	**α = 0.73**	**3.74**
By observing what others do I learn well.	0.72	3.67
I take notes and writing down facts I learn.	0.72	3.77
Learning through observation is a good way for me.	0.66	3.92
Looking things in detail by dividing them into separate parts is enjoyable for me.	0.64	3.66
Listening quietly rather than speaking up in class is better for me.	0.57	3.69

Factor Loadings were shown next to each factor name row.
The factor loadings were greater than 0.50.

According to cluster analysis, 21 students (8%) were in the first cluster as serious analytical learner, 244 students (89%) fall under the second cluster as active practical learner, 8 students (3%) were third cluster as observation concrete passive learner. As a conclusion for cluster analysis, the majority of the students 89% were seemed as active, practical learners.

Analysis for Consumer Decision-making Styles

For values of KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) were higher than acceptable point of 0.50. (KMO, 0.853 > 0.50) and Bartlett's Test of Sphericity was significant.
(KMO: 85%, Barlett: 3366.30, df: 325, p< 0.001). The students' consumer decision making styles was 65.549% of variance and a range of eigenvalues of 1.452 to 6.816 that eigenvalues were greater than 1 as shown in Table 3. The factor loadings for decision-making styles of students displayed in Table 4 and six styles were found.

Table 3: Reliability of consumer decision making factors and variance.

Factors	Number of items	Eigen values	%of variance explained	Coefficient Alpha
Brand Conscious, Price Equal Quality consumer	7	6.816	17.095	α = 0.89
Perfectionist, High Quality Conscious consumer	5	3.367	12.655	α = 0.84
Confused by Overchoice consumer	4	2.339	11.773	α = 0.88
Recretional –Time Conscious consumer	5	1.808	8.924	α = 0.75
Brand Loyal Consumer	4	1.452	7.896	α = 0.79
Price Conscious, Careful consumer	3	1.261	7.205	α = 0.65
Total Variance explained			**65.549%**	

Table 4: Factor Analysis for Consumer Decision making Styles

Decision Style Characteristics Statements	Factor Loadings	Mean Value
Factor 1 Brand Conscious, Price Equal Quality consumer	**α = 0.89**	**3.39**
My favorite is well-known national brands.	0.62	3.43
My choice is usually more expensive brands.	0.72	3.37
Higher priced product is better in its quality.	0.86	3.41
Best products are offered by nice department and specialty stores.	0.80	3.40
Buying the best-selling brands is my choice.	0.84	3.33
Usually the best choices are the most advertised brands.	0.74	3.45
My wardrobe is up-to-date with the changing fashions styles.	0.54	3.36
Factor 2 Perfectionist, High Quality Conscious consumer	**α = 0.84**	**3.75**
What is vital for me is to get very good quality.	0.76	3.75
My effort is to get the very best or perfect choice while purchasing products.	0.80	3.88
Buying the best overall quality is my concern generally.	0.79	3.90
For choosing the very best quality products I place special effort.	0.63	3.57
For me fashionable, trendy and attractive styles are very important.	0.54	3.63
Factor 3 Confused by Overchoice consumer	**α = 0.88**	**3.43**
So many brands to choose among often confuses me.	0.82	3.51
Choosing which store to shop is sometimes hard..	0.82	3.38
Choosing the best seems to be harder when I learn many information about products..	0.86	3.51
Many information about different products are confusing.	0.85	3.33
Factor 4 Recretional –Time Conscious consumer	**α = 0.75**	**2.93**
For my purchases I really don't think or care so much.	0.64	2.73
For me going shopping is not a pleasant activity.	0.79	2.98
Its a waste of time to shop through stores.	0.82	2.78

My shopping style is fast.	0.69	3.23
Factor 5 Brand Loyal Consumer	**α = 0.79**	**3.64**
I stick to a brand that I like.	0.81	3.64
Everytime I shop I visit the same stores.	0.70	3.43
I buy my favorite brands repeatedly.	0.68	3.86
Factor 6 Price Conscious Careful Consumer	**α = 0.65**	**3.87**
At discount prices I buy as much as possible.	0.78	3.79
Looking for the best value for the money is important to me.	0.80	3.95
Watching my spending is what I carefully monitor.	0.69	3.86

Factor Loadings were shown next to each factor name row.
The factor loadings were greater than 0.50.

Also the students have six types of decision making styles: brand conscious people think that they like to buy expensive and well known brands. The shop's environments also affect their purchases. They like to focus on well known and best selling brands. At the same time, they follow the fashion trends. Perfectionist people thought that the quality is one of the most important vital things. They like to select the best brand and best quality. Also, they have some styles as fashionable and trendy. Confused by overchoice people think that, variety of brands was caused confusion in their minds. They feel that, when they get deep information about the brands, it's not easy for them to choose among alternatives. They are overloaded with information. Recreational time conscious people take care on their purchases. They prefer to go to shops as a pleasant activity. Brand loyal people have some favorite brands and shops. They prefer to buy same brands repeatedly. Price conscious people prefer to make shopping during the discount periods. They are carefully choosing the brands with the consideration of value.

According to cluster analysis, 77 (28%) students were in the first cluster as brand conscious, 36 (13%) students fall under the second cluster as high quality conscious, 40 (15%) students were third cluster as confused by over choice, 48 (18%) students fall under the fourth cluster as recreational time conscious, 33 (12%) students were at the fifth cluster as brand loyal, 37 (14%) students were at the sixth cluster as price conscious individuals.

Analysis of the Correlation between Learning Styles and Consumer Decision-making Styles

Table 5 Pearson correlation coefficient between each decision-making style and learning style

Learning Style Characteristics

Consumer Style Characteristics		Serious Analytical Learner	Active Practical Learner	Observation centered Concrete Detail Learner
Brand Conscious	Pearson Correlation	.103	.070	.259**
	Sig. (2-tailed)	.090	.249	.000
	N	274	274	271
Perfectionist	Pearson Correlation	.342**	.339**	.326**
	Sig. (2-tailed)	.000	.000	.000
	N	274	274	271
Confused by overchoice	Pearson Correlation	-.051	-.016	.047
	Sig. (2-tailed)	.404	.786	.442
	N	274	274	271
Recreational	Pearson Correlation	-.072	-.190**	-.080
	Sig. (2-tailed)	.236	.002	.189
	N	274	274	271
Brand Loyal	Pearson Correlation	.219**	.201**	.200**
	Sig. (2-tailed)	.000	.001	.001
	N	274	274	271
Price Conscious	Pearson Correlation	.495**	.526**	.386**
	Sig. (2-tailed)	.000	.000	.000
	N	274	274	271

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson correlation coefficient was computed to assess the relationship between each decision-making style and learning style in Table 5. Pearson Correlation as shown at the above table, serious analytical learner had positive relations with price conscious (.50), perfectionist (.34) and brand loyal consumer (.22) styles with using the alpha level of p< .01. The active practical learner had positive relationship with price conscious careful consumer (p=.53), Perfectionist consumer (p= .40), Brand Loyal consumer (p=0.20) with using the alpha level of p< 0.01. Also, there was an inverse relationship exist among active practical learner and Recreational Time consciousness consumer (p=-0.19) with using the alpha level of p<0.01. The observation centered concrete detail learner had positive correlation with price conscious (.39), perfectionist (.33), brand conscious (.26) and brand loyal (.20) consumer styles with using the alpha level of p<.01. According to Pearson correlation analysis, serious analytical learner (.50) and active practical learner (.53) had highest meaningful positive relationship with price consciousness style.

CONCLUSION

As a conclusion, three learning styles were found among university students in EMU, North Cyprus which the majority of students were active practical learners. Also, six decision making styles were found among university students. It was the first attempted research focusing on both Turkish students' decision making styles and learning styles in a study. The 21 learning styles and 40 consumer style statements were asked to the respondents. The 44 statements out of 61 founded as meaningful for the recent study. Serious analytical learner and active practical learner had highest positive correlations with price consciousness style. Also, the serious analytical learner had positive relations with price conscious, perfectionist and brand loyal consumer styles. The active practical learner had positive relationship with price conscious, perfectionist consumer and brand Loyal. Also, there was an inverse relationship exist among active practical learner and Recreational Time consciousness. The observation centered concrete detail learner had a positive correlation with price conscious, perfectionist, brand conscious and brand loyal styles.

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PROJECT AND RESEARCH BASED MASTER'S PROGRAM IN ENGINEERING

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Abstract

A new International Master's Program, in the field of metal forming, is developed successfully in the departments of Material Science at Dalarna University, Sweden. The program developed with cooperation of steel and manufacturing industries in the region, among others, Volvo Car Corporation, SSAB, Ortic AB and Jernkontoret - the Swedish Steel Producers' Association. The engineering specialization of the program focused on Steel Materials, Advanced Forming Processes, Surface Technology, Modelling and Simulations, Micro-structure Developments in plastic forming operations and Tribology.

The program is mainly project-based, with focus on practical application of industry. Each project combines theory with opportunities for students to develop their problem-solving capabilities. The program includes projects and the courses are divided into modules.

In addition to the mentioned Master's Program, the department developed too net-based courses within the program to make more accessible for those working in the industry and choose to take some individual courses.

Taking sheet metal forming as main forming process, the purpose of this program has been to complement the present disproportion of Swedish engineering in sheet metal forming and to strengthen the technical competence and competitiveness of the Swedish steel and manufacturing industries.

In addition to that, to fulfil the educational needs of Erasmus and other exchange students (Erasmus Learning Agreement), the department offered advanced level projects and research based courses, corresponding to 30 ECTS credits.

Due to many courses of the program is taken in conjunction with other established Swedish Master's Program, the Non-EU/EEA international students got great opportunity to integrate easily to the Swedish social and educational system, to get access to Industrial projects and to establish a network with steel and manufacturing industries representatives. The Industrial cooperation with the department includes course development, industrial visits, guest lectures, producing industrial projects and helping in conducting industrial laboratories at the industries. That cooperation expected to open good job opportunities within industries, both for EU/EEA and Non-EU/EEA citizens.

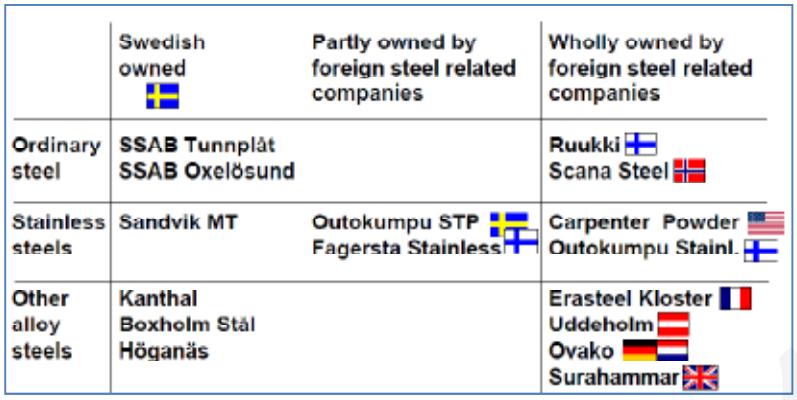
Background

Steel industries in Dalarna and neighbouring municipalities traces in its roots far back in time and the region now has some of the world's most modern steel industries, among others, SSAB (a global leader in value added high strength steel), Sandvik (a high-technology, engineering group with advanced products and a world-leading positions within selected areas), Ovako (a leading European producer of long special steel products), Outokumpu (a global leader in stainless steel products including hot and cold rolled, precision strip, tubular and long products). To strength to strengthen engineering competence and to cover the need of the companies, Dalarna University adapted a Master's Program, Master's Programme in Metal Forming and Surface Technology, 120 ECTS-credits.

Dalarna University is the fastest growing university in Sweden. The university specialised in Humanities and Media Studies, Health and Social Studies in campus 1 (Falun city) and Technology and Business Studies in campus 2 (Borlänge). One of the peak competence areas in Technology is Material science division, specialized in Materials, Advanced Forming Processes, Surface Technology, Modeling and Simulations, Sheet Metal Forming, Micro-structure developments and Tribology. These kind of is specialized became obvious for Dalarna University due to many Swedish and multi-national leading steel companies [1] are located at Dalarna and neigboring municipalities, Figure 1.

For that reason, the Swedish steel industry with the cooperation of Jernkontoret - the Swedish Steel Producers' Association and steel companies started graduate school at Dalarna College with specialization in Material Science. The graduate school is started in order to secure recruitment to the field of material science and to build new competence in the field, i.e. to secure Swedish steel research in the future, as well as to educate more researchers.

To fulfill the needs of the regional steel industries, the core study areas of Material Science defined to Metal Forming, Material Characterization, Surface Technology and Modelling and Simulation. Hereby



	Swedish owned	Partly owned by foreign steel related companies	Wholly owned by foreign steel related companies
Ordinary steel	SSAB Tunnplåt SSAB Oxelösund		Ruukki Scana Steel
Stainless steels	Sandvik MT	Outokumpu STP Fagersta Stainless	Carpenter Powder Outokumpu Stainl.
Other alloy steels	Kanthal Boxholm Stål Höganäs		Erasteel Kloster Uddeholm Ovako Surahammar

Figure 1: ”Swedish” steel producers 2007, the companies are classified accord ng to their main production policy [1]

Introduction

The Material Science depatment plays a decisive role in the development work to meet the needs of the regional steel and manufacturing industries. For that reason, in addition to the existing Swedish Master’s Program [2], a new International Master’s Program in the field of *Metal Forming and Surface Technology* was adapted successfully in 2010 [3]. The new International Master’s Program is based on applied industrial technologies and research related projects. The courses in the program are composed of lectures, industrial- projects, laboratories and visits. Industrial- projects and laboratories are associated with existing industrial problems and planned future developments.

In addition to that, to fulfil the need of exchange students (Erasmus students) and to fulfil Erasmus Student Mobility Learning Agreement, the department offered advanced level project and research based courses, corresponding to 30 ECTS credits [4].

The Program is open to students with different backgrounds in Materials, Processes and Applications. The programme is designed for students who are interested in continuing to doctoral studies and/or working as project leaders in industrial R&D within the steel industry or in various manufacturing industries. Graduated students from corresponding Swedish Master’s Program, Figure 2, achieved to get qualified engineering jobs in the regional steel and manufacturing industries or PhD positions. In the last 5-6 years, about 95% of graduated students got the mentioned job positions. The new Master’s program is expecting to give similar results and that will give International students good opportunities to get and industrial jobs and PhD positions. Typical job positions for graduate students include Process Development, Forming Specialist, R&D, Technical Support, Mechanical Engineers and Production Control.

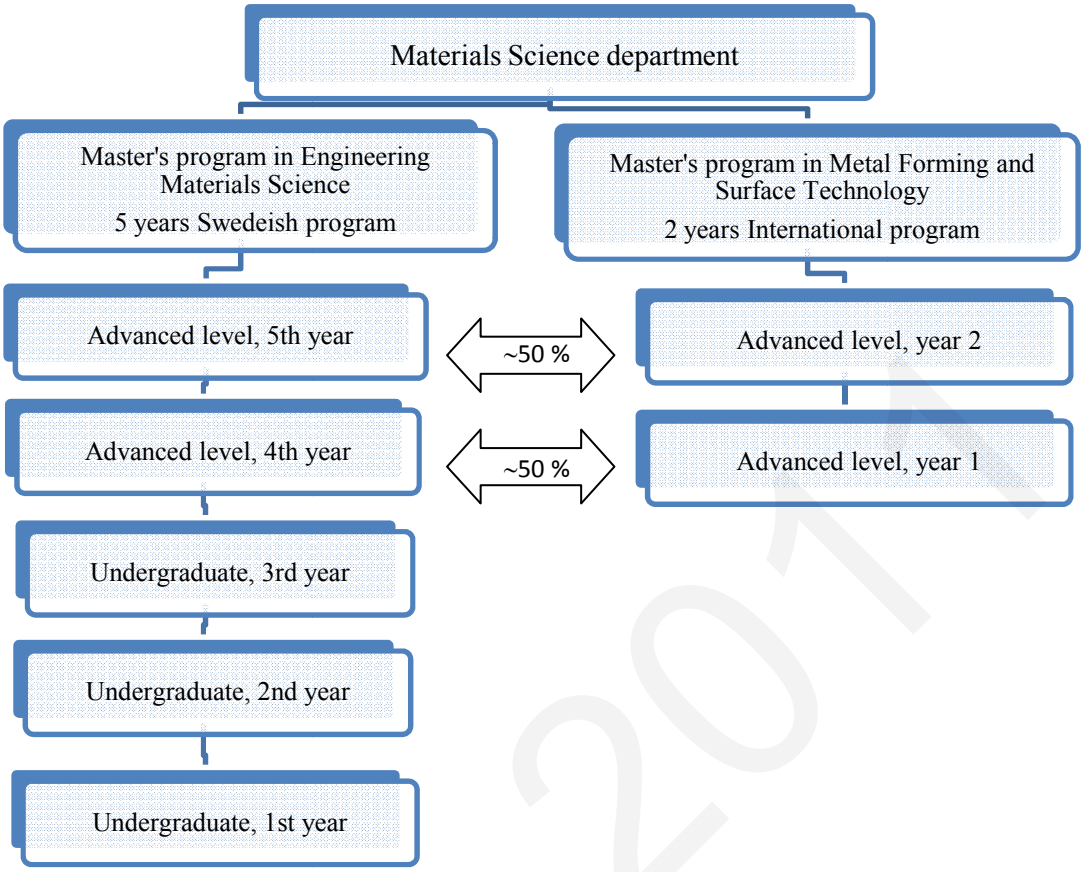


Figure 2: Structures of Master's programs at the department of Material Science at Dalarna University

Procedures

The development of the new International Master's Program initiated by regional steel and manufacturing industries, where reference group from those companies (producers and users) participated actively in shaping and promoting the core subjects of the program. The program is integrated to 50% with the Swedish Master's Program, where the Swedish and international students study together in the same class. This study method gave Swedish students more International experiences. International students benefited too in social and educational integration and got more access in Swedish steel and manufacturing industries. In addition to that, the participation of guest lecturers in the courses helped International students to establish a network with the companies.

Been Sheet Metal Forming as a main forming process of the program, the main reasons of initiating and developing of the program are:

- Fast growing Swedish steel and manufacturing industries and Swedish steel industries' quick recovery from the global financial crisis
- Increased recruitment due to high retirement in the companies and training and recruitment young engineers
- Specialization and niche marketing of special products, formed with Advanced Sheet Metal forming processes, among others Roll forming and Hydroforming processes
- Geographical benefits, where the leading Swedish steel and manufacturing industries are situated in Dalarna and neighbouring municipalities [1], Figure 3
- Flexible study, retraining industry employees' by adjusting some courses in the program as net-based courses, making them more accessible for those working in the industry who choose to take the whole programme or individual courses only.
- Partnership with trade & industry and community

Concerning flexible study or web-based study, the web-based distance learning allows employees in the mentioned companies to study in their free time and improve their knowledge in Materials Science. Dalarna University use advanced web tools to deal with the Web-based study [5], among others; Connect (meeting platform for teachers and students online), Fronter (online learning platform), Videochat (attend lectures that are broadcasted live while chatting with classmates) and iTunes-U.

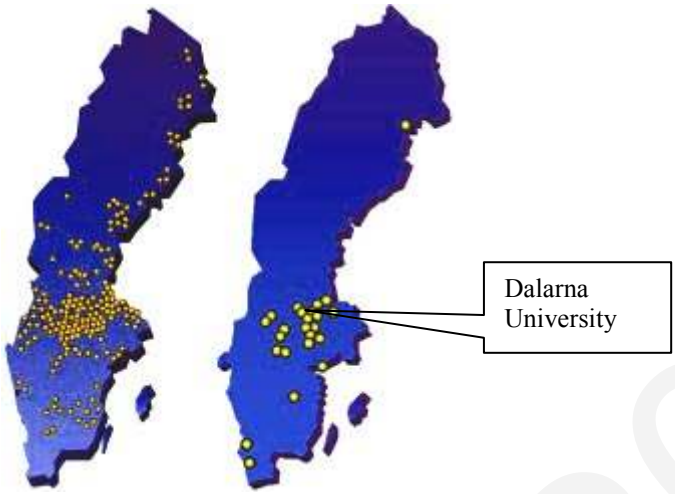


Figure 3: Localisation of the Swedish steel industries, the left shows the extension of the steel industry in 1850 while the map to the right its extension today [1]

Results and Discussion

The adaption of the new Master's Program in the field of Metal Forming and Surface Technology attracted students from different parts of the world; Asians, Africans and Europeans. Due to 50 % of the courses are taken together with the Swedish Master's Program, the international students got good chance to integrate easily to the Swedish society and to exchange experience with Swedish colleagues. Using advantages of guest lecturers from companies and industrial laboratories and visits, international students could establish good contacts with Swedish steel and manufacturing industries. Those networks expected to give qualified jobs in steel companies and or some PhD positions at the department.

As most of Asian education systems are much more theoretical, the courses in the program which is based on practical applications, helped international students to develop their skills of implementation and to realize the potential competence and competitiveness of the steel industries.
From companies' perspective, the companies got great opportunities to observe the potential of International students and to cover their need to solve their engineering problems in the field. This new challenge gave department to broaden opportunities for undergraduate, postgraduate and research education efforts and recruiting PhD candidates.
The planned web-based courses (distance courses), which is the reflection of the campus courses, can also give good opportunities for companies to retraining and develop their employees and to keep pace with the new developments in the field.

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PROJECT-BASED LEARING WITH AN ONLINE PEER ASSESSMENT SYSTEM IN A PHOTONICS INSTRUCTION FOR ENHANCING LED DESIGN SKILLS

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ABSTRACT

This study proposed a novel instructional approach, a two-stage LED simulation of Project-based learning (PBL) course with online peer assessment (OPA), and explored how to apply OPA to the different structured levels of a problem in a PBL course to enhance students' professional skills in LED design as well as meta-cognitive thinking. The participants of the study, 73 junior students were divided into two groups, OPA group (with OPA) and Traditional group (without OPA). The evaluation results were listed as follows. (1) Most students agreed that the two-stage LED simulation of PBL course was challenging and interesting and they learned useful things from the course. (2) OPA group performed better than Traditional group in concept clarification. (3) As for the enhancement of LED design skills, OPA group performed better than Traditional group in structured problem solving yet in ill-structured problem solving. (4) OPA group benefited in inquiry learning and reflective thinking abilities cultivation.
Keyword: Project-based learning, Online peer assessment, Problem structure, Meta-cognitive thinking.

INTRODUCTION

The application scope of LED devices has widened recently. Taiwan has gained the second largest market share in the global LED market since 2002 and its market size for LEDs will be NT$540 billion in 2015 (Huang, 2009). Efficiently fostering LED device design professionals has become an issue in higher education to meet the growing demand for the engineers in Taiwan's LED industry. For a student in higher education to successfully completing a LED design requires prior knowledge of semiconductor physics, quantum mechanics, optoelectronics, and material science. Universities need to offer an interdisciplinary curriculum that combines theory and practice to engage students in authentic real-world tasks and to develop their skills in problem solving (Macías-Guarasa, Montero, San-Segundo, Araujo, & Nieto-Taladriz, 2006).

Project-based learning (PBL), a student-centered teaching approach, enables students to integrate their knowledge, skills, values, and attitudes and to construct knowledge through a variety of learning experiences (Maskell & Grabau, 1998). Students deal with interdisciplinary issues as well as pursue solutions to a problem by asking and refining questions, debating ideas, making predictions, collecting and analyzing data, drawing conclusions, and communicating their findings to others (Macías-Guarasa et al., 2006). Moreover, with the assistant of computer simulation technology, the strength of PBL has been highly enhanced for the decades. Simulation-assisted learning (SAL) can help students understand the real world, be able to explore and test hypotheses, and come to a reasoned explanation of the phenomenon in question (Lunette and Hofstein, 1991; Stern, Tao, Yarbrough, Rothmayer, Rajagopalan, Otta, Caughey, Bhaskaran, Smith, Hutchings, & Moeykens, 2006). Furthermore, the time and cost required for the development of the products can be markedly reduced by the elimination of unnecessary trial fabrications (Yaeger, Halamek, Coyle, Murphy, Anderson, Boyle, Braccta, Mcauley, Sandre, & Smith, 2004; Chang, Chen, Kuo, & Shen, 2010). Nevertheless, some studies have revealed that the simulation itself cannot provide an abundant learning environment and that one-on-one simulation-based instruction cannot enrich knowledge acquisition (Rieber, & Parmley, 1995).

Peer assessment recently has often been applied as an alternative assessment method in many different fields, (Strachan & Wilcox, 1996; Falchikov, & Goldfinch, 2000). In the process of peer assessment, students are able to evaluate and learn from peers' work and comments, then work with self-comparison; discover the shortcomings of their own work, and determine the right way to improve their works (Topping, 1998;

McGourty, 2000). Thus, the process enhances students' meta-cognitive understanding about their own learning process (Wen & Tasi, 2006); and develops their social and transferable skills (Topping, 1998), and helps them to clarify their misconceptions.

With the vigorous development of information networks, online peer assessment (OPA) has been a success, providing a more comfortable learning environment that is free from geographic and time constraints, and that allows participants to work and be graded anonymously (Davies, 2000; Tsai, Liu, Lin, & Yuan, 2001; Freeman, & McKenzie, 2002;). Many studies have focused on the factors affect the performance of OPA, including the number times of OPA (Tsai, Liu, Lin, & Yuan, 2001), students' perception about PA (Wen, & Tasi, 2006), teachers' perception about PA (Wen, , Tasi, , & Chang, , 2006) and providing the prerequisite instruction and training of OPA for students before conducting OPA (Orsmond & Merry, 1996). However, few literature deals with how OPA works in different structured levels of problems in a PBL course which could be an important guidance for teachers to successfully implement OPA in PBL.

This study proposed a novel instructional approach, a two-stage LED simulation of PBL course with OPA to enhance students' learning performance in LED design. Moreover, the study explored how to apply OPA according to the level of structured problem in a PBL course to enhance students' meta- cognitive thinking. Knowledge maps, a photonics scoreboard, and the Constructivist Project-based Learning Environment Survey (CPLES) (Chang, 2006), quantitative research approach, were conducted to demonstrate the effects of this learning course. Furthermore, an in-depth-interview, a qualitative research approach, was used to gather an in-depth understanding of students' behavior and the reasons that govern such behavior. The study addressed the following research issues. (1) The effect of OPA upon concept clarification. (2) The effect of OPA upon enhancing LED design skills in structured problem solving. (3) The effect of OPA upon enhancing LED design skills in ill-structured problem solving. (4) The effect of OPA upon attitude toward PBL.

Two-stage LED simulation of PBL course with OPA

According to the theories of constructivism (Honebein, 1996; Wilson, 1996; Tsai, 1998; 2000) and cognitive load (Sweller, Van-Merrienboer, & Paas, 1998), the two-stage LED simulation of PBL course with OPA was developed to enhance students' professional skills in LED design as well as meta-cognitive thinking. The computer simulation software, APSYS, developed by the Crosslight Software Inc., Canada, was adopted in the PBL course. To achieve the above objectives, the LED simulation of PBL course was divided into two stages. The first stage aims to help students learn the operation of APSYS and realize the concept of the active region and how parameters influence an LED. Thus, the project at the first stage was developed as a well-structured problem which was easier for students to solve. The goal of the second stage was to help students realize that several parameter settings could achieve the development goal for the given wavelength, current, and power. Students should find an optimal solution among these parameter settings. The project at the second stage was developed as an ill-structured problem which provided more challenge for students to overcome.

Figure 1 shows the LED simulation of PBL with OPA. First, the instructor assigned a project to all the teams. Second, the students discussed this between themselves and researched information online and in textbooks or technical journals to form their initial ideas. Third, students performed simulations to clarify their concepts. In this step, the teammates were expected to produce a solution to their set project following the simulation. In the fourth step, students checked if their solutions met the aim of the project. Students who had met the objective at this stage finished the simulation. Students who had not achieved the project goal were required to repeat steps 3–5. Repeating steps 3–5 helps students to build their concepts of the operating principle of LEDs. In the sixth step, all teams compared their results when they had achieved the objective. The team online PA step enabled the students to examine each others' results to understand how to gain better results by using different parameters.

Online peer assessment

In the online PA system, there were two kinds of identities: teacher (administrator) and student. Figure 2 showed the OPA system provided teacher with the mechanisms to control and manage OPA process. The functions of OPA system provided for the student's were to upload their homework, assess each other, and provide suggestions about others' projects. The study conducted OPA three times. Only the last two scores were adopted as the evaluation, since the first one was given to students as the OPA training to ensure its validity.

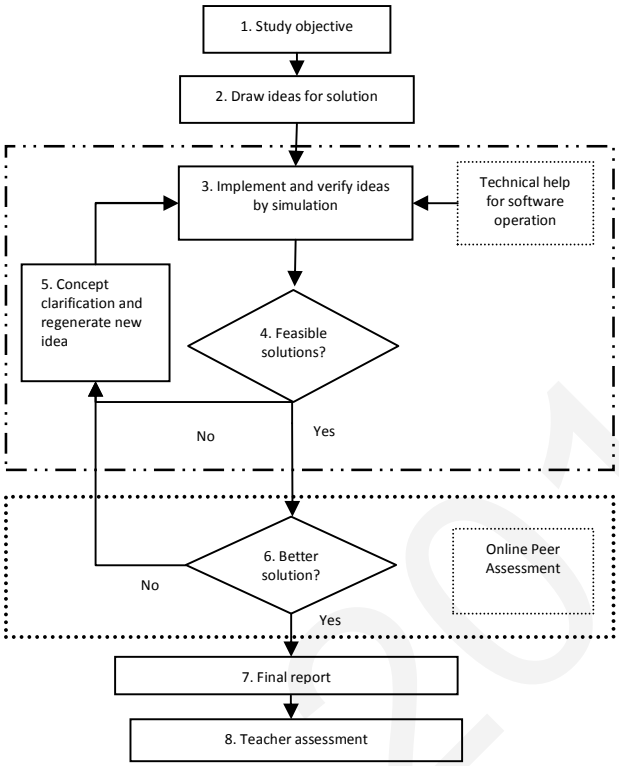

Figure 1. Process of simulation-based learning with online peer assessment

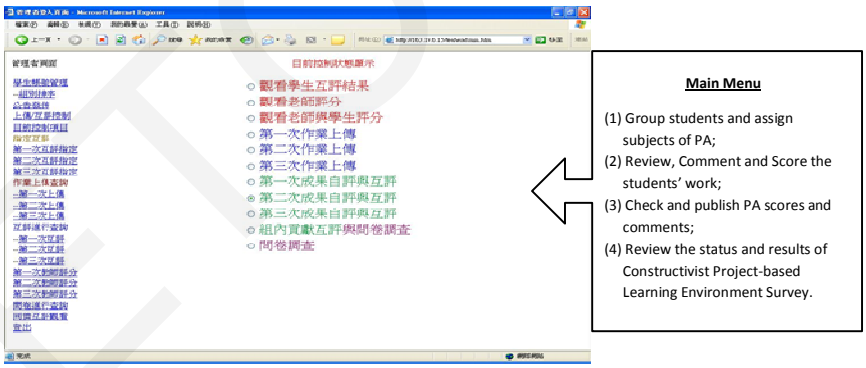

Figure 2. Administrator control interface of OPA

METHOD

Participants

The participants of the study were 73 junior students of two classes, the Department of Physics, National Changhua University of Education, Taiwan. This instruction was implemented in a one-semester Experimental Physics.

Experimental design

The 73 junior students were divided into two groups. One group was labeled as "OPA group" (with OPA); the other was labeled as "Traditional group" (without OPA). In addition to learning the operating principle of LEDs by SAL, the teams of OPA group were requested to review the other three teams' projects and give review comments twice at each stage. Therefore, each team received review comments from three teams to

help clarify their concepts and correct the parameters of their LED design. The teams of Traditional group learned the operating principle of LEDs only by SAL and worked on the project without OPA.

Evaluation tools

As mentioned, the study measured students' knowledge, skill, and attitude in terms of three evaluation tools, a knowledge map, a photonics scoreboard, and the CPLES, respectively.

The knowledge map was adopted to evaluate the students' understanding of the principles of LED operation. In the project-based instruction procedure, students were required to present their concepts of the LED via a knowledge map both before and after the course to examine whether the OPA helped them improve their understanding of the concepts of the LED. An expert in the department of Physics, National Changhua University of Education, graded the students' knowledge maps based on the linkages between concepts. A correct proposition scored one point and an incorrect proposition scored zero points.

The study created the photonics scoreboard, built on an internet platform, for peer and expert assessments. The photonics scoreboard had five rating items: the accuracy of device structure, originality, parameter adequacy, device performance, and device applicability. Each item was scored on a scale of 1–6 points. Moreover, the scoring system provided reviewers with an open-ended column in which they could make review comments to peers' work. Students could learn from peers' work and comments, and then improve their works.

The CPLES was adopted to investigate the students' attitude towards the PBL environment. Students were surveyed with the CPLES, a 5-point Likert-scale questionnaire (1 = strongly disagree, 5 = strongly agree), as shown in Table 1. In analyses of the reliability and of the exploratory factor of the CPLES, the Cronbach α for the whole instrument is over 0.95, and the amount of explained variance is over 62% for each field test (Chang, 2006). Both figures were high enough to demonstrate that CPLES can be applied to assess the students' attitude.

Table1: Items for each sub-scale of the Project-Based Learning Environment Survey

Questions for each sub-scale
Upon completion of the project-based learning course, please answer the following questions.
Inquiry learning sub-scale - I had the opportunity to: 1. Conduct research to find the answers to questions. 2. Conduct research to verify my ideas. 3. Proceed with further research to solve new problems. 4. Design/develop research methods by myself. 5. Collect data, analyze data and present the report.
Reflective learning sub-scale - I had the opportunity to: 1. Reflect on how I learn things. 2. Deliberate upon my thoughts in detail. 3. Learn how to become a better learner. 4. Present my areas of uncertainty. 5. Criticize my own research results.
Teamwork sub-scale - I had the opportunity to: 1. Use the information provided by group members to solve problems. 2. Contribute to the group goals. 3. Help other group members with their work. 4. Be a leader to teach other group members. 5. Exchange and share information or opinions with other students. 6. I loved working with my teammates.
Creative problem solving sub-scale - I had the opportunity to: 1. Detect errors and confirm that they were properly corrected. 2. Propose my own creative ideas. 3. Apply my creative ideas into designs or assigned tasks. 4. Evaluate all the possible solutions to problems.
Open-endedness sub-scale - The teacher let us: 1. Design methods for problem-solving by ourselves. 2. Present our own project proposals. 3. Use various types of data to solve the same problem in different ways. 4. Study the particular problems of our own that interested us. 5. Decide how to proceed with our project. 6. Solve problems from various perspectives.
Authenticity sub-scale 1. The problems met in this project indicate the complexity of practical problems. 2. The information presented in this project is relevant to authentic real-world problems. 3. The knowledge and experience provided by this project are relevant to authentic real-world problems. 4. The problems in this project are derived from practical problems in authentic real-world tasks. 5. Upon the completion of this project, I fully understood its objective and the subject matter.

Experimental procedure

Figure 3 shows the procedure of the PBL with OPA. The analysis of the evaluation data were listed as follows.

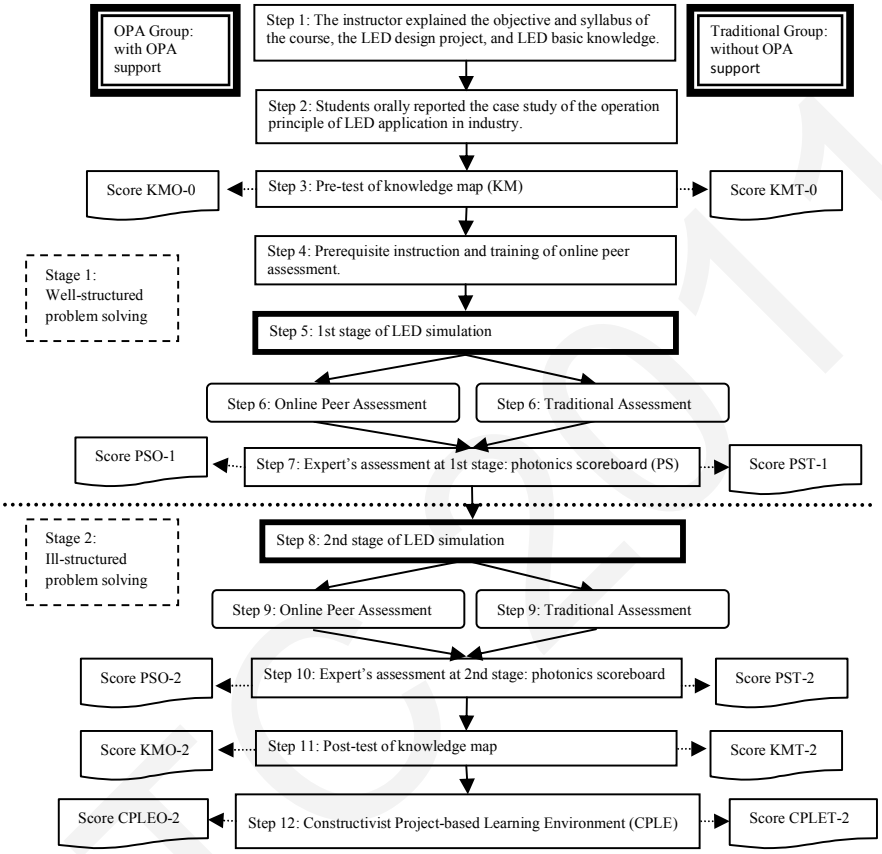

Figure 3. Procedure of the project-based course with online peer assessment and related evaluations

RESULTS

Effect of OPA upon concept clarification

In order to determine if these two groups had the same levels of knowledge on the principles of LED operation before OPA treatment, a t-test of independent samples on the scores of knowledge map pre-test for these two groups (scores KMO-0 and KMT-0) was performed. Since the Levene test on homogeneous variance is not significant ($F = 0.014$, $p = 0.908$), the t-test on the scores of pre-test could be proceeded with and the results were listed in Table 2.

Table 2: t-test of the pre-test knowledge maps for OPA group and Traditional group

	N	M	S.D.	t value	P
Knowledge map pre-test of OPA group	37	2.78	1.456	1.864	0.067
Knowledge map pre-test of Traditional group	36	2.08	1.746		

* p<0.05, ** p<0.01, *** p<0.001

The pretest result revealed that these two groups had similar levels of knowledge on the principles of LED operation before proceeding with the project. To determine if the effect of OPA upon concept clarification worked significantly, the Levene test on homogeneous variance was adopted firstly ($F = 3.965$, $p = 0.050$), and

the t-test on the scores of knowledge map post-test for these two groups (scores KMO-2 and KMT-2) were listed in Table 3.

Table 3: t-test of the post-test knowledge maps for OPA group and Traditional group

	N	M	S.D.	t value	p value
Knowledge map post-test of OPA group	37	5.16	1.21	3.767*	0.000*
Knowledge map post-test of Traditional group	36	3.69	2.03		

* p<0.05, ** p<0.01, *** p<0.001

The t-test result revealed that the scores of OPA group on knowledge map post-test is significantly higher than those of Traditional group, which means the effect of OPA upon concept clarification worked significantly.

Effect of OPA upon enhancing LED design skills in well-structured problem solving

To determine if the effect of OPA upon enhancing LED design skills in well-structured problem solving worked significantly, the Levene test on homogeneous variance was adopted firstly (F＝1.132, p=.291), and a t-test on the expert's assessment scores of photonics scoreboard on well-structured problem solving for these two groups (score PSA-1 and PSB-1) were listed in Table 4.

Table 4: t-test of the expert's assessment scores on well-structured problem solving for OPA group and Traditional group

Well-structured problem solving	N	M	S.D.	t 值	p value
Expert's assessment scores of photonics scoreboard for OPA group	37	21.73	1.503	5.136***	0.000
Expert's assessment scores of photonics scoreboard for Traditional group	36	20.03	1.320		

* p<0.05, ** p<0.01, *** p<0.001

The t-test result revealed that the scores of OPA group on photonics scoreboard is significantly higher than those of Traditional group, which means the effect of OPA upon enhancing LED design skills in well-structured problem solving worked significantly.

Effect of OPA upon enhancing LED design skills in ill-structured problem solving

To determine if the effect of OPA upon enhancing LED design skills in ill-structured problem solving worked significantly, the Levene test on homogeneous variance was performed (F＝2.037, p=.158), and a t-test on the expert's assessment scores of photonics scoreboard on ill-structured problem solving for these two groups (score PSO-2 and PST-2) were listed in Table 5.

Table 5. t-test of the expert's assessment scores on ill-structured problem solving for OPA group and Traditional group

Ill-structured problem solving	N	M	S.D.	t 值	p value
Expert's assessment scores of photonics scoreboard for OPA group	37	21.86	.585	-1.029	.307
Expert's assessment scores of photonics scoreboard for Traditional group	36	22.00	.535		

* p<0.05, ** p<0.01, *** p<0.001

The t-test result revealed that there is no significant difference between the performance these two groups, which means the effect of OPA upon enhancing LED design skills in ill-structured problem solving did not work significantly, though it did in well-structured problem solving.

Effect of OPA upon attitude toward PBL

To determine if the effect of OPA upon attitude toward PBL worked significantly, a t-test on CPLES for these two groups (scores CPLEO-2 and CPLET-2) were listed in Table 6.

Table 6: t-test of the scores in Constructivist Project-based Learning Environment Survey for OPA group and Traditional group

sub-scales	A N=35		B N=30		t-test	
	M	S.D.	M	S.D.	t	p value
Inquiry learning	3.70	0.41	3.42	0.53	2.435	.018*
Reflective learning	3.81	0.41	3.60	0.38	2.142	.036*
Teamwork	3.93	0.40	3.77	0.46	1.461	.149
Creative problem solving	3.71	0.57	3.64	0.49	.494	.623
Open-endedness	3.62	0.69	3.62	0.56	.015	.988
Authenticity	3.54	0.54	3.51	0.60	.257	.798

The t-test result revealed that the scores of OPA group on the subscales of CPLES, inquiry learning and reflective learning, were significantly higher than those of Traditional group, which means the effect of OPA upon enhancing students' inquiry learning and reflective learning worked significantly better. For the rest subscales, there is no significant difference between these two groups.

Interview results- qualitative feedback

In order to gather an in-depth understanding of students' behavior and the reasons that govern such behavior, we collected the feedback from the final project presentations of each group and then conducted an in-depth interview with them after the presentation. The interview were recorded and encoded. S1 represents the interview results with OPA group, S1-1 represents the interview with the number one team of OPA group, and S2 for Traditional group, and so on.

Students' opinions on online peer assessment

S1-1: Comments and advice from others is helpful to refine our work, but assessing other's work is even more important and we learn more.

S1-3: We could learn useful knowledge and practical skills from this interesting course. At the beginning, we do not know how to review other's work…we were not sure if our suggestions is correct or not, but after two or three OPA experience, we had more confident when rating our peer.

S1-4: Although the figure did not match the requirement at the first try, we adjusted the parameters according to comments from classmates, and the results were better.

S1-6: According to the simulation results and online PA, we could summarize the regulation of parameter adjustment, and generalize the operating principle of LEDs.

Students in OPA group considered that OPA helped them improve their works effectively. Students of the first, third, fourth, and sixth teams agreed that OPA could help them to modify their works by taking others' comments. However, some complains which could be a valuable reference to improve the implementation of OPA in PBL were listed as follows.

S1-2: Because we had too much subjects to learn in this (junior) year, we could not do our best in this course especially in OPA. Besides, we needed to start preparing for the entrance examination of graduate schools at this year.

S1-5: Most of the review comment worked well, but sometimes it failed and misled our focus on problem solving. We doubted that some reviewers tried to give wrong comment purposely for the sake of getting competitive advantages.

S2-12: We always waste much time in adjusting parameters by guessing. When you adjust a new parameter, you have to rerun this program and it took a long time.

Students' opinions on two-stage LED simulation of PBL course

Some comments were made by Traditional groups.

S2-1: The two-stage LED simulation of PBL was interesting yet challenging. We learned useful things from the course.

S2-2: At the very beginning, we felt excited while we knew this PBL course would be provided for us at this semester, but we are frustrated to design LED by guessing the parameters. We are not used to this course; we have no idea how to adjust the parameters from the huge scope of numbers.

S2-3: We suggest that the teacher give us more references so that we could use them to optimize our parameters.

According to the interview results, we discovered that students of both Traditional and OPA groups were not used to such instruction and they could not learn independently and actively, which could be the problem for most of students in Taiwan. Some of them also demonstrated a lack of self-confidence when rating their peer, which is similar to the previous studies (Orsmond & Merry, 1996; Sullivan, Hitchcock, & Dunnington, 1999). Students thought that failure caused frustrations and cost too much time. The second and sixth teams of Tradition group indicated that this course differed from those they had taken previously, so they feel excluded and frustrated. Furthermore, students hoped that the teacher could provide more knowledge and hints about the parameters of LED; the students showed an over-reliance on books as well as teacher's assistance, and were not able to search for information actively. Furthermore, their first priority was passing the entrance examination of graduate schools to fulfill with the expectation from their parents or society. Therefore, they push themselves very hard to learn effectively and prevent from making any "try and error" which could be harmful to enhance their meta-cognitive skills and self regulation learning.

CONCLUSIONS

The study addressed and explored how to apply OPA according to the structured level of a problem in a PBL course to enhance students' professional skills in LED design as well as meta-cognitive thinking. The

evaluation results elicit some relevant facts:

(1) Most students agreed that the two-stage LED simulation of PBL was challenging yet interesting and that they learned useful knowledge and practical skills from the course.
(2) OPA group performed better than Traditional group in concept clarification.
(3) As for the enhancement of LED design skills, OPA group performed better than Traditional group in structured problem solving; there is no significant difference between the performances of these two groups in ill-structured problem solving.
(4) OPA group benefited in inquiry learning and reflective thinking abilities cultivation.

Most students of OPA considered the PBL course with OPA to be an effective tool in understanding operating principle of LEDs and clarifying concepts which were similar to the studies of Topping (1998), and Wen & Tsai (2006). However, the OPA did not work significantly to enhance the students' professional skills in LED design as well as meta-cognitive thinking in ill-structured problem solving.

Skill acquisition is a process of procedural knowledge learning and automation in domain-specific knowledge. Practice and feedback as well as analogies were helpful for students to combine the practical skills with procedural knowledge (Gagne, Yekovich, & Yekovich, 1993). However, it should be noted that practice in skills to achieve proceduralization should not be overemphasized. Over-automated basic skills, which might cause the "set effect/Einstellung effect" and make learner become inflexible to deal with novel/ill-structured problems, is harmful to skill learning and skill transfer (Luchins, 1942; Gagne, Yekovich, & Yekovich, 1993). The mechanism which allows the first schema activated by familiar aspects of a problem to control the subsequent direction of attention may contribute to a wide range of biases in expert thought – from confirmation bias in hypothesis testing to ignore results that do not fit their favored theories (Bilalic, McLeod, & Gobet, 2008). Moreover, the quality of problem definition determined the quality of the solution (Getzels, 1975). In the study, some teams of OPA group were misled in the wrong direction on problem definition or solving which were suggested by peer reviewers.

Some students commented that they learn slowly and they need more time to get the project down. Wallas (1926) pointed out that a creative problem solving process involves four-stage-- "preparation," "incubation," "illumination," and "verification" which all took time and required learner to be more patient to implement. Therefore, the above issue required more precaution when the course were developed and implemented.

Limitations

Even though a rigorous research procedure was used, this work has some imitations that could be addressed in future studies. First, a quasi-experiment design was adopted without detailing the individual difference of learners. Individual difference variable, such as learning style, could be a direction for future study. Second, the findings and implications are obtained from just one study that examined a particular computer simulation software (ie, APSYS) and targeted a specific group in Taiwan. Thus, caution must be taken when generalizing our findings and discussion to other educational technologies or groups. Third, the students in Taiwan have unique value and behavior patterns, such as they had different definition on learning achievement and their first priority was to pass the entrance examination. Therefore, a cross-cultural validation using another large sample gathered elsewhere is required for further generalization of our findings.

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PROSPECTIVE SPECIAL EDUCATION TEACHERS' UNDERSTANDINGS OF TECHNOLOGY AND ITS USE IN INTERVENTIONS FOR CHILDREN WITH AUTISM

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Abstract

Autism and technology use are the two basic concepts examined in this research study. Autism is a pervasive developmental disorder which causes deficits in social interaction. Individuals with autism sometimes may not be able to talk or may choose not to talk. Therefore; there needs to be some other ways to communicate with children with autism. Presently, technology, specifically educational technology comes to the scene to help this communication problem. Individuals' definitions of technology may confuse with their definitions of science. Although technology is neither the same nor the product of science, people sometimes use these terms interchangeably. Children with autism, as well as other special needs children, need highly qualified teachers to help them communicate the world. Based on the explanations above, this research study examines prospective special education teachers' understandings of technology and its use in interventions for children with autism. Thirty prospective special education teachers from a big scale university located in Marmara region participated in this research study. Data were collected through a questionnaire developed by the researcher and a series of semi-structured interviews. Questionnaire includes open-ended questions to examine participants' understandings of autism, technology, and use of technology in interventions for autism. Interviews are also structured around these three issues. Data gathered from questionnaire and interviews were analyzed qualitatively. Open coding is used in the analysis part. Based on the analysis, three assertions about participants' understandings of autism, technology, and the use of technology for autism were generated and presented in the paper.

Key words: autism, technology use in special education, prospective special education teachers

Introduction

The National Autistic Society (NAS) in the United States is among the most prestigious institutions for autism throughout the world. NAS (2000) addressed the following difficulties as the impairments for children with autism: difficulty with social relationship, difficulty with verbal, non-verbal communication, and difficulty in the development of play and imagination. Additionally, there could be repetitive and stereotypical behavior patterns and resistance to change in daily routine. Schlosser and Blischak (2001) reported the estimation of various studies that 25% of 61% of children with autism remain essentially non-speaking. This estimation underlines the importance of finding communication ways other than speaking. Dautenhahn (2000) discussed two ways of connecting individuals with autism to non-autistic world. One way of communication is to teach individual with autism necessary skills to survive in the world outside. The other way is to let them live in their own world which will make

them happier. Before making a choice, it is important to understand what autism is and how these people feel.

One of the ways to understand how they feel about the world and people is to use an interactive technology in education and rehabilitation of individuals with autism. Using more interactive rather than remote-controlled technology for rehabilitation is a recent approach for communication. In this approach, learning about social-emotional cues of children with autism is supported by technology embedded to instruction (Dautenhahn, 2000).

Goldsmith and LeBlanc (2004) mention about several research studies investigated diverse applications of technology-based interventions for children with autism. These diverse applications include two types of designs. Some interventions are designed for indefinite use and they are called assistive technology, like augmentative communication devices, and some are designed for a specific purpose and once the purpose is reached the intervention, temporary instructional aid, is removed. This second category includes tactile and auditory prompting devices, video-based instruction and feedback, computer-aided instruction, virtual reality and robotics.

Mirenda (2001) provided a review of the empirical literature on the number of topics related to Augmentative and Alternative Communication (AAC) and assistive technology used in supporting communication and learning of individuals with autism. In this review, it was argued that AAC interventions included wide range of strategies whose common goal is either to help in communication with others or to understand communication from others. These strategies could be classified support for input and support for output. Input strategies might include schedules, visual symbols for choice making, and aided language stimulation. Stromer, Kimball, Kinney, and Taylor (2006) identified activity schedules, which mentioned in Miranda (2001), as the means of promoting independent execution of previously learned responses by using mostly pictures. Stromer et al (2006) report preliminary studies illustrate how activity schedules delivered on the computer may engender new learning with the use of videos, sounds, dialogues, images and the words as instructional stimuli. Computer activity schedules might be used to teach academic skills like reading, writing and math. Stromer et al (2006) also reported a research study in which a computer program made in power point was used to teach a seven-year old girl with autism. They also proposed that money and number skills might also be taught as tasks embedded in computer activity schedules.

Output strategies might include visual-spatial symbols, picture exchange communication system (PECS), and functional communication training. Mirenda (2001) also emphasized VOCA, which was a portable, computerized device to produce synthetic or digitized speech output when activated, and an empirical study to demonstrate the potential use of VOCA to support the communicative interactions of children with autism. Schlosser and Blischak (2001) also talk about the empirical studies in which teachers' and unfamiliar persons' ratings about children's VOCA communication. Ratings provided social validation support for contextual appropriateness of VOCA.

Although VOCA and PECS are both output strategies, VOCA is a pointing-based system, whereas PECS is exchange-based system.

Other than teaching academic skills, Schreibman, Whalen and Stahmer (2000) investigated the use of video priming to reduce disruptive transition behavior in children

with autism. This is another example for the use of technology in teaching children with autism.

Lastly, collaborative virtual environment (CVE) is another use of computer technology for people with autism. Moore, Cheng, Mc Grath and Powell (2005) designed an empirical study to determine if children with autism could understand basic emotions by interacting with collaborative virtual environment. CVE is a software program designed to evaluate participants' ability to identify and make inferences from facial expressions.

The review of the literature cited above displayed that technology use in interventions for children with autism is not new in Europe and US. Although the number of people with autism is increasing rapidly in our country, there is a limited number of research study focused on different interventions to teach social and academic skills to children with autism. The use of technology, specifically computer technology, is a new concept for professionals and academicians in Turkey. Therefore; this research study is focused on prospective special education teachers' understandings of technology and its use in interventions for children with autism. Following research questions were investigated in this research study:

1. What is participants' understanding about autism?
2. What is participants' understanding about technology?
3. What is participants' understanding about use of technology in interventions for people with autism?

Method

Research Participants:

Research study is designed in a qualitative manner. The researcher is an instructor in the elementary education department of a faculty of education located in Marmara Region, Turkey. Research participants were students of special education department of the university in which the researcher was working. Thirty prospective special education teachers, at their sophomore level, were participated in this research study. The research participants were attending a course named "teaching science for special education children" and instructed by the researcher.

Data Collection:

Data collection process took place within the framework of the course mentioned above. A questionnaire designed by the researcher and semi-structured in-class interviews were data collection techniques used in this research study. The questionnaire includes seven open-ended questions to examine participants' understandings of autism, technology and use of technology in interventions for autism as described in the research questions above. Interviews were also structured around these three items.

Data Analysis:

Data gathered via questionnaire and interviews were analyzed qualitatively. First; participants' responses to each item in the questionnaire were open-coded separately. Open coding of the responses to seven questions resulted in three categories: autism, technology, technology use in autism. Then, in-class group interviews were open-coded and codes from interviews were used to support the three categories cited above. The researcher generated three assertions based on these categories. These assertions are presented in the findings and conclusion section below.

Findings and Conclusion

The research questions were revisited and assertions related to research questions were generated at the end of data analysis. In the section below, each research question identifies an assertion. Each assertion explains how participants responded to research questions.

Assertion 1a): how participants define autism:

Prospective special education teachers define autism as a developmental disorder which shows itself generally with the lack of social communication skills and limited language use before age 3.

Almost all participants defined autism as a developmental disorder. Following excerpts from questionnaire and interviews illustrate examples to their definitions.

"…is a social developmental disorder which limits the social communication skills of the individuals…" (Q1).

"…it [autism] occurs before 3 years-old. Sometimes language does not develop.." (Q2).

Following excerpt from interview support the excerpts from questionnaire above.

"…well…it [autism] is a disorder which prohibits to communicate with others…I think…it must be either before age 3 or around 3 I think so.." (I3).

Although most of the participants define autism as developmental disorder, only one used the term illness for the definition of it.

"[autism] is an illness then there is no recovery for it.." (Q5).

A literature review focused on people's definition of autism support data for both of these ideas. Broderick and Ne'eman (2008) worked on autism as metaphor in their research study. They reported two metaphors consistent with our research participants' definitions: "autism is being different" and "autism is an illness". First metaphor put emphasis on the differences among people and counts this developmental disorder as a difference. This metaphor was created by people with autism. The second metaphor counts autism as an inborn illness and created by people without autism. Broderick et al (2008) defined autism as decreasing the communication with people and the world outside and start to communicate with the self.

Assertion 1b): symptoms of autism:

Prospective special education teachers cited lack of speech, eye contact, and imitation skills among the symptoms of autism as well as citing no reflection to their names when called, stereotypical hand motions and attention deficits.

All research participants were aware of the basic symptoms of autism as cited in the assertion above. The following excerpt displays the point.

"…[their] attention span is too short, there are lack of eye contact, lack of speech and they cannot imitate what you do…even if you call their names, they do not look at you…" (Q27).

The following excerpt from interviews supports the issue above.,

"I know people with autism cannot develop eye contact with the others and they have limited language ability…..they make something typical with their hands…stereotypical I think…" (I5).

Special education departments are not the places which were facilitated to raise teachers for people with autism. Although it is the case, prospective special education teachers participated in this research study, have adequate understandings about autism and its symptoms.

Assertion 2: how participants define technology:

Prospective special education teachers define technology as devices helping people to reach the information resources and making life easier.

The word technology makes participants to think about computers, TV, video and overhead projectors. Therefore; it can be concluded that participants have very limited understandings about what technology is. They also cited some devices like audiometers, machines for magnetic resonance among the technology used in medicine. Followings are the excerpts supporting their understandings about technology.

"…[technology] is designed with the purpose of making life easier for human being…" (Q13).

"…[technology] helps us to reach resources of information…TV, computers, overhead projectors are the technologies in education" (Q22).

"..audiometers, tomography devices, MR devices are examples of technology in medicine I think…nothing for education I know other than computers and videos…" (I3).

Three excerpts presented above display participants' limited understandings about technology. Technology needs not to be an electronical device as participants emphasized. This is consistent with what Aydin and Tasar (2010) argue about the prospective teachers' definitions of technology. Functional definition of technology is "changing natural world to fulfill our needs" (Aydin, Tasar, 2010). This definition includes something more than electronic devices and computers.

Assertion 3: what participants know about the use of technology in autism:

Prospective special education teachers do not have adequate information about the use of technology in interventions for children with autism.

Although there is an increasing number of research studies in countries located in Europe and US, as cited in the introduction part of this paper, prospective special education teachers participated in this research study were not well informed about the technology available for people with autism. Only two of the participants emphasized video modeling, voice recording, and activity schedules among the technology used in the interventions for autism as displayed in the following excerpt.

"I attended a seminar a week ago….talked about the activity schedules but I am not sure…" (I7).

"I only know three things, activity schedules, video modeling and recording the voice of person with autism…you can make him to listen to his own voice then…don't know anything else…" (I4)

The excerpts above illustrate these two participants' limited knowledge about technology use. They have heard the names but they did not really understand how it works.

Three assertions for the three categories informed researcher that research participants were good enough in understanding what autism is and what are the symptoms. They do not show the same level of understanding about what technology is and how it is used in autism. Literature review in the introduction part of the paper informs us in dealing with more technology in the interventions for people with autism.

Based on the findings of this research study and literature reviewed, it is necessary to inform instructors and teachers of special education children to use more technology in their teaching process. In the universities, there need to be more courses focused on how to use technology in teaching social and academic skills to children. At the graduate and in-service level, there also need to be in-service training courses and programs designed with the same purpose.

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READING OF TURKISH E-BOOK FOR VISUALLY IMPAIRED

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Abstract
In this article, SWOT analysis of reading of Turkish e-book system has been revealed. Reading of Turkish e-book is examined in terms of system availability especially for the visually impaired. Tests and evaluations are implemented using Turkish speech synthesis module which is developed by us.
Keywords: Turkish speech synthesis, e-book, visually impared

1. INTRODUCTION

Speech is one of the methods for providing communication between people. The production process of human speech by an external computer or devices according to the phonetic expansion of text or message is called synthesizing. (DUTOIT, 1997) Speech synthesis can be done by adding audio tracks to each other which is stored in the audio recording database. Phonemes or systems that use audio tracks as phoneme binaries have the opportunity to synthesizing all kinds of words in a small amount of record using lego logic. (DUTOIT, 1996) However, these kinds of synthesis systems are very poor for intelligibility and naturalness. In this regard, the unit selection systems that use longer pieces of audio are used more widely today. (KOMINEK, 2003) (J. ZHANG, 2004).

Turkish studies are still limited even though very large numbers of systems are developed for western languages. MBROLA (DUTOIT, 1996) FESTIVAL (DUBUISSON, 2009) MULTEXT (VERONIS, 1994) GENGLISH (DUTOIT, 2005) HTS (YAMAGISHI, 2007) have been developed for synthesizing more than one language. From these systems MBROLA is adapted for Turkish and a working system is developed. (BOZKURT, B., 2001). Although there has been some works for Turkish there is not a working system.

In this study, triple sounds which is the most frequently used in Turkish and an additive synthesis system which is developed by using double voices that were not covered by triple sounds is used. (YURTAY, 2010)

It is clear that speech synthesize is a critical tool to access to information especially for the visually impaired people. In this context, especially visually impaired people's need for reading book without another person help comes up. Ink printed resources in Turkey are vocalized by volunteer readers and speech synthesizer applications after transmitted to computers via the scanner and they are shared with visually impaired via internet or in CD format by related agencies. The number of resources is very low accessible by the visually impaired people because of resources take more time to be vocalized in this way and also there is lack of human resources need to process voice. On the other hand, the voice recording format (MP3) used for resources makes search and browse the publication complicate for readers. Moreover, access to those resources which are saved in suitable formats for visually impaired is limited because of cost and use of tools for accessing dubbed resources. Increasing the number of

resources which may be accessible by visually impaired who have very limited possibilities for information in current situation and reaching these resources by all the visually impaired in easy and effortless way regardless of socio-economic status is targeted. Reading and access to information is one of the fundamental rights and freedoms for every person. It says that there is large responsibility in governments for the all sections of society benefit from those rights in many declarations on human rights at the international level and in the contract. World Health Organization defines "handicapped person" as individual who has limitation in one or more major life activities (walking, seeing, hearing, speaking, breathing, learning and working) and has physical or mental disorders.

2.DISABLED POPULATION RELATED STATISTICS IN TURKEY

Table 1 – Disabled population related statistics in Turkey (TÜİK,2002)

The proportion of disability, 2002 (A.Total B. Male C. Female)									
	Total disabled population			Orthopedically, seeing, hearing, speaking and mentally disabled population			Population having chronic illnesses		
	A	B	C	A	B	C	A	B	C
Turkey	12,29	11,10	13,45	2,58	3,05	2,12	9,70	8,05	11,33
Age group									
0-9	4,15	4,69	3,56	1,54	1,70	1,37	2,60	2,98	2,20
10-19	4,63	4,98	4,28	1,96	2,26	1,65	2,67	2,72	2,63
20-29	7,30	7,59	7,04	2,50	3,34	1,74	4,80	4,24	5,30
30-39	11,44	10,43	12,42	2,56	3,18	1,95	8,89	7,26	10,46
40-49	18,07	15,15	21,08	2,65	3,29	1,99	15,43	11,86	19,09
50-59	27,67	22,56	32,67	3,23	3,73	2,74	24,44	18,83	29,94
60-69	36,96	31,60	42,02	5,14	5,65	4,65	31,82	25,95	37,37
70+	43,99	39,77	47,77	7,89	8,45	7,38	36,10	31,32	40,39

As shown in Table 1, disabilities in the total population are 12.29% according to the results "2002 Turkey Disability Survey" which was made by Turkey Statistics Institute (TUIK) and with the cooperation of Prime Ministry Administration for Disabled People.

Table 2 - Proportion of disabled population in Turkey, according to the type of disability (TÜİK, 2002)

The proportion of disabled population by type of disability, 2002 (%)					
	Orthopedical disability	Seeing disability	Hearing disability	Speaking disability	Mental disability
Turkey	1,25	0,60	0,37	0,38	0,48
Age group					
0-9	0,64	0,33	0,20	0,46	0,42
10-19	0,77	0,36	0,29	0,43	0,58
20-29	1,21	0,45	0,32	0,42	0,65
30-39	1,26	0,46	0,35	0,31	0,54
40-49	1,39	0,62	0,35	0,26	0,39
50-59	1,79	0,91	0,41	0,30	0,26
60-69	2,80	1,56	0,77	0,41	0,27
70+	3,94	2,98	1,70	0,39	0,31

According to the results shown in Table 2 in the same study, visually impaired population in Turkey constitutes 0.60% of the total population. Cause of visual disability is loss of function in any center which is responsible for visual sense. Eye diseases such as diabetic retinopathy (as a result of lack of blood that

is needed for retina or stuffed blood) and pigment retinitis (caused by deterioration of the retina), cataract (as a result of the loss of clarity in eye lens) may cause vision loss. "Partial sightedness", "low vision", "legally not see/blind" and "totally not see/blind" are terms used in this context for individuals with visual disabilities.

3.CHALLENGES OF DISABLED POPULATION IN TURKEY

The most preferred conducting library services method for the visually impaired in our country is dubbing the resources. Analog recording system had been used until the 2000s; especially the books sung by volunteer readers were presented to beneficiaries in tape format. Librarianship companies offer services for the visually disabled have begun to make new records in digital systems and to digitize existing analog records because of the development and widespread use of digital recording techniques.

Related organizations share dubbed and saved books in MP3 format in CD format or through the internet for beneficiaries. But it is undeniable fact that the target audience cannot be reached yet in desired efficiency and prevalence.

Table 3 – Challenges of visually impaired population in Turkey (TUIK, 2002)

Challenges of Visually Impaired Population in Turkey	Male (%)	Female (%)	Total (%)
Not sufficient audible warning signals in public areas and environmental regulations	35.97	33.83	35.06
Difficulty taking public transport vehicles	32.09	38.28	34.70
Not able to attend social and cultural activities	77.54	51.31	27.07
Negative effects on marital life	16.46	15.61	16.10
Lack of the community help	27.25	27.46	27.34
Lack of facilities provided by the state	51.88	51.18	51.58
Not able to buy tools for diasability	**38.44**	**40.63**	**39.36**
Not enough and widespread of Braille and audio publications	**27.90**	**24.30**	**26.38**

Again the results of Challenges of Visually Impaired Population in Turkey are given in table 3 in the same study. Today, considering the difficulties of people living with disabilities, it is obvious that large part of it is lack of provided facilities and lack of Braille and audio broadcasts.

Today, information technology, the Internet and advances in the field of electronic publishing provide important opportunities to people who cannot benefit from ink-printed sources. For example, a person who is visually impaired if he has the necessary software or hardware and wants to follow a daily newspaper or a magazine monthly If you have Internet broadcast he can easily follow the broadcast by means of screen readers. However, the reasons such as advantage of the high costs for solutions of information technologies to take by people with disabilities, limited of prevalence or such complexity of an important training process is limiting the number of people can benefit from this opportunity.

4. SWOT ANALYSIS FOR READING OF TURKISH E-BOOK

Strengths	Weaknesses
1) Synthesized speech intelligibility is high and expandable by web technology **2)** Advanced algorithms, low hardware requirements and be compatible with emerging mobile technology. **3)** Emerging technologies, compatible with a limited range of application areas to give a high possibility of synthesizing. **4)** Existing technologies use the accumulated resources and adaptability to the technology used. **5)** As a result of work done for other languages of international multi-media document standard (DAISY) should be prepared for and adapted to the Turkish.	**1)** Synthesized speech quality (naturalness) and the desired level synthesis is not required to improve the quality of infrastructure prosodic (duration model, emphasizing the model, intersection and transition models) is not sufficient for studies relating to Turkish. **2)** There is not sufficient study on Turkish phonetic alphabet and therefore initiative failure to meet the desired level. **3)** Synthesis of the model necessary for the creation of the acoustic sound of the database to be used for determining the corpus is difficult. **4)** Describing feelings and the transmission of the synthesized speech technology is not sufficient to reach maturity yet. **5)** Cleaning of irregular corrupted data in existing systems and the processing of the data needed for creation of acoustic models for synthesis to the database bring an intense workload.
Opportunities	**Threats**
1) To gain popularity multi-language translation technologies especially in the field of language to language voice translation and Turkish involvement in this research field **2)** Ink printed on paper can be transferred to electronic media and Turkish synthesizer for the visually impaired to meet the need for applications to be developed in this field. **3)** The increasing popularity of private investment is an important component of speech and language technologies in calls for national and international projects and similarly, the increasing need for applications to facilitate especially the disabled, the elderly and the lives of children in ambient assisted living (Ambient Assisted Living) technologies. **4)** Supporting the right of access to information by laws and "Talking Library" application has been received by the Republic of Turkey Ministry of Culture. **5)** Increasingly widespread use of mobile technologies used in every area of our life and to be a solution for all kind of people with disabilities needs.	**1)** Discomfort of listener because of synthetic speech in long-term and people begin to the reaction to this type of audience. **2)** Mobile technologies copyright problems and usage of pirated products negatively affect the expansion of the e-book industry **3)** Economic difficulties in finding an e-book synthesizers, difficulties of using existing tools and different interest in new technologies because of the challenges of economic, socio-cultural and educational qualifications. **4)** Narrated narrative synthesis expectations change from person to person. **5)** Ambient assisted living technologies are less awareness.

5. CONCLUSION

Social needs met through data with simple, inexpensive and compatible technologies in each electronic area. When the requirements are considered, including the Turkish area of research and synthesized speech intelligibility is high then this study will find a place in the emerging technologies. It can be said that adopted and used these types of studies will be popular via Internet. Spread of the application will be evidence in the right direction.

With respect to widespread social curiosity and hesitation at the beginning of human life into such technologies is examined and then used this situation has been observed to occur as a requirement of the state of need.

Through this application, all kinds in the study with the prosodic infrastructure development and without the time constraint will allow the development of all aspects of synthesized speech.

6. ACKNOWLEDGEMENT

We would like to thank TUBITAK UEKAE Multi-Media Technology Research and Development Lab for providing the database and knowledge-sharing for Turkish speech synthesis module used in this study. In addition, we would like to thank Mr. Ibrahim BİNGÜL who is visually impaired from birth for helping us in the testing phase.

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Reviewing MEBBIS As An Electronic Performance Support System

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ABSTRACT

In today's world, the flow and growth of information is occurring so rapid and besides it is exposed to many metamorphoses continuously during this flow. Due to these swift flows and metamorphoses, organizations are facing challenges to organize the exponentially growing and swiftly flowing information and to transfer the information to other novice and even experienced members of itself. To sort out such challenges instructional designs are used for reliable, continuous and systematic transferring of information. But instructional designs should offer efficient and effective solutions in the process of transferring. The offered solutions may not be all consist of conventional instructional methods. Nowadays using non-instructional methods in learning environments are also an effective way of facilitating learning. These methods are categorized under Human Performance Technology concept. And Electronic Performance Support Systems (EPSS) are one of core components in setting up the infrastructure of Human Performance Technology environments. This paper's aim is to review the MEBBIS (Ministry Of Education Information Systems) of Turkey according to the EPSS criteria and features which were derived from Human Performance Technology references.

Keywords: Human Performance Technology, Electronic Performance Support Systems, MEBBIS.

INTRODUCTION

The history of Electronic Performance Support systems goes back to 1980's. "Pioneers of EPSS movement include Barry Raybould, who proposed ways computers could be used to solve human performance problems and Gloria Gery, who coined the phrase "electronic performance support systems"" (Mckay&Wager,2009). As half life of knowledge is decreasing so fast compared to the old times and moreover the knowledge is growing exponentially, it is not easy for organizations to keep their members up to date with the new information related to their duties in a work environment. EPSS was born from the need to organize the knowledge in an organization and make it available to the members just in time as needed. Therefore, EPSSs can be referred as self learning environments supported with computers. With EPSSs workers learn independent of other colleagues and even they can contribute the knowledge base of the system if faced with any new information or a useful experience in performing tasks in a work environment. Gery (2002) states the function of the EPSS as:"In light of data that were recorded before or recorded just in that time, the software might guide users in performing a task, transforming and storing data, and can present alternative interfaces and interactions due to the hierarchies in the organization".

The definition above gives us a general understanding about the EPSS systems. Raybould, states the essential features of EPSS systems more specifically as presented below. According to the "Raybould(1995)'s definition, EPSS should provide integrated access to:

1. Information.
2. Give advices.
3. Provide learning experiences.
4. Have tools for oneself to manage to perform a task with the minimum help of others"(Mckay&Wager,2009).

In this study, the MEBBIS system was reviewed categorically in light of the essential features given above. The study may help to depict the MEBBIS's current state as an EPSS and maybe useful in forecasting the future of MEBBIS as an EPSS.

WHAT IS MEBBIS?

MEBBIS is the abbreviation of Ministry Of Education Information Systems of Turkey. Ministry of Education of Turkey is one of the biggest organizations in the country with its vast number of members and institutions it possesses. It is very crucial for the organization's administrators and members to have immediate access to necessary information to maintain the continuity of tasks and processes in synchronization and harmony. The requirement of synchronization and harmony in processing information has led to the establishment of the first government Information Management System (IMS) system called ILSIS. ILSIS was built by Educational Technologies Department of Ministry Of Education in 1995. Since then, ILSIS was exposed to many transformations and has had its current structure with the name of MEBBIS.

MEBBIS is designed as an online system which can be accessed via the internet and contains many sub-modules that are grouped according to their functions and objectives. Modules are grouped under eight headings. These headings are: MEBBIS Main Menu, Personnel Operations, E-School, E-Graduate, Public Education, Open Education Institutions, E-Dorm and E-Inventory. All sub-modules that are listed under these categories worth studying separately but below, only the content of main headings are given generally.

MEBBIS HEADINGS

MEBBIS Main Menu: Here, the majority of modules are related to the financial issues of Ministry Of Education of Turkey and mostly used by institute managers and directors.

Personnel Operations: The modules in this category are widely used by all members of Ministry Of Education. They contain personnel information such as total years of service, the proceeding of ongoing investigations about personnel's acts and so. Besides working as an information database, the modules under this heading are used for online application procedures like applications of transfer from an institution to another within or out of Turkey and for applications of in service training programs.

E-School: This heading is designed for k12 schools of Turkey. Teachers and directors have direct access to students' personal information databases and are allowed to input and update required fields of these databases. The updated information is seen by other teachers and directors just in time while they are updated. Moreover, the parents are allowed to access to databases and display scores , attendancy reports of their children without waiting the end of term school reports.

E-graduate: The aim of this heading is to provide vocational guidance to the future graduates of primary schools. Tracking the employment statistics of k12 graduates is another objective of the category.

Public Education: With the modules that are listed under this category, The Apprenticeship And Public Education Department follows the online procedures of educating apprentices for private sector and organizing local courses that are open to public.

Open Education Institutes: Online proceedings of open primary and secondary education programs are handled in the modules of Open Education Institutes heading.

E-Dorm. In e-dorm modules, the online tasks of dormitories belonging to primary and secondary schools are performed.

E-Inventory: Institutions keep and report the records of their inventories in e-inventory module.

REVIEWING MEBBIS ACCORDING TO THE ESSENTIAL EPSS FEATURES

EPSS should provide integrated access to information: Gery stresses on the point that the information available to EPSS users should be grouped hierarchically and access to information should be limited according to the users' status in the organization. This protects users from being overloaded by irrelevant information to perform his task (Warshawsky, 2001). It can be inferred that currently MEBBIS

is mostly serving as a system that is providing integrated access to information. System resembles a gigantic database. It groups users accordingly depending on their position in the Ministry Of Education hierarchy. Users' access to information is limited with group policies. Besides, MEBBIS works integrated with the MERNIS which is the Information Management System of Department of Population. In such cases like divorce, death or birth, MEBBIS updates itself simultaneously with MERNIS records. Thereby the personal information of students in MEBBIS is kept up to date all time.

MEBBIS is useful for planning and organizing many events in education. In example; in 2010, a literacy campaign was announced by The Department of Education of Arnavutköy in İstanbul. Because education levels of the parents were recorded in it, MEBBIS helped organizers to identify illiterates in Arnavutköy. Again, names and pages of all books a primary kid reads throughout a year is recorded in the system, and it is possible for Ministry Of Education to calculate how many books are read totally in primary schools of Turkey.

The weak point of the system regarding the given criteria is that it is designed as an information base mostly for high level officials. Students can only use the system to see their exam scores and attendance reports. Teachers are only allowed to see the records of their own classrooms and to display their personal records. There are no information resources which may help teachers in teaching activities. No resources were also identified for training teachers for personal development. It might be useful to add such resources like plans or lesson materials to MEBBIS system to make it appealing for low level officials in Turkish education system.

EPSS Should Provide Integrated Access to Advice: It is hard to say MEBBIS is a well organized advisor in performing tasks. For now, it only gives automated advices when officials are filling online application forms. If an official inputs wrong data or the official is not allowed to do the specific application, he or she is warned and a short advice is displayed on the screen how or what to do complete the application. It is seen that to help officials in performing newly announced tasks, MEBBIS is not used for the distribution of manuals and guides. All departments in Ministry Of Education publish their own electronic manuals and guides via their websites. But joining and publishing all manuals of different departments under MEBBIS roof might be more efficient and effective.

EPDS Should Provide Integrated Access To Learning Experiences: It is inferred that while designing MEBBIS, the main intention was not to provide an environment to facilitate learning of personnel using the MEBBIS. Currently there are no modules serving to facilitate learning experiences. MEBBIS is mostly designed as an information base. But for the following years, it can be expected to integrate learning environments to the system.

As declared by In-Service Training Department of Ministry Of Education, in 2010; 47389 personnel were planned to be trained in in-service training courses. Again in 2010, the average number of course hours per participant was 18 hours and the cost of all courses per participants was 207 TL. (Hizmetiçi Eğitim Daire Başkanlığı, 2011). Currently there are two types of in-service training programs for teachers in Turkey. The statistics are for central in-service training programs in which the participants are accommodated in several cities. Unfortunately; Department of In service Training Department enrolls only a small portion of teachers applying to the courses. Other issue is that teachers are travelling to other cities for the courses and stay away of their classes even for weeks during course times. It is personally witnessed that headmasters of some schools are not approving the application of teacher to online courses because the education in school is pausing. To have an estimate cost of in service training programs of Ministry Of Education, if 207 TL (the cost/participant) is multiplied with 47389(total of participants) the result becomes 9809523 TL. After these calculations some questions may come into mind. Can we give in-service training courses online? What percentage of courses can be given online? If the courses are given online, will the cost/participant decrease? If the courses are given online, will the number of participants taking the course increase? Finding the answers for these questions may help us to decide whether MEBBIS should be designed for facilitating learning experiences in future.

EPSS Should Provide Integrated Access To Tools Help Someone Perform A Task With Minimal Support From Others: One of the aspects what makes MEBBIS so useful for Ministry Of Education personnel is that it has decreased phone calls, one on one meetings, paper transfers and other

communication processes within and among institutions. It seems obvious that the users of the MEBBIS find it time saving and efficient.

Another objective of EPSS systems is to help newcomers in performing their duties fully from the first day they start working in the institution. To manage this aim, it can be expected from EPSS to provide orientation support to new comers. Thereby, the newcomers will not be dependent on other officials to learn their duties and the way the institution works. In MEBBIS, there is no such a service helping new officials to adapt to their institutions. The orientation activities are carried out locally for new officials. In example, the new teachers of a town are gathered at the weekends in a school to take orientation seminars and courses which continue about three months. In short, it would be useful to add such tools that help officials to solve the problems on their own in MEBBIS.

Conclusion

The MEBBIS is evaluated according to the Raybould's EPSS criteria. MEBBIS seems to be short falling to cover the necessities of the criteria "to provide integrated access to a) advice, b) learning experiences, c) tools to help someone perform a task with minimal support from others". On the other hand MEBBIS is quite useful and strong to meet the requirements of criteria that "EPSS should provide integrated access to information base". In future, it is expected to improve the deficiencies of MEBBIS to meet the requisites of all essential criteria that will turn MEBBIS to be a complete EPSS and supposedly make it more efficient and widespread. But even now with its incompetence in some points, MEBBIS is one of the most indispensable tools for the organizations of Turkish education system.

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ROLE OF ADVANCED E-LEARNING TECHNIQUES IN ENHANCING PHARMACY STUDENTS' MULTIDISCIPLINARY EDUCATION

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ABSTRACT:

Multidisciplinary education attracts the attention of many educators in the health education sector. They look at it as being more effect in concentrating the focus of the different health care professionals involved in the education toward providing real-time, outcome-oriented and problem-based education. It is a platform for the education reliable to prepare mature students for the real world challenges. However, there are many challenges that form obstacles from implementing this efficient paradigm. Among the major challenges, approachability of the different health care professionals particularly in cities with high traffic e.g. Riyadh, represents a debilitating communication difficulty. These problems can be overcome at least partly by inventing several technology-based strategies such as web 2.0 tools, mobile learning and ubiquitous learning. The paper give an overview about how these different strategies can address the challenges facing multidisciplinary education in the health education and assessment.
Review of the literature revealed the value of web 2.0 tools in creating sharing, communication and collaboration attitudes among students under the supervision and mentorship of their supervisors with subsequent evaluation and correction of the supervisors.
Research in the field of mobile learning revealed the importance of this tool in the monitoring, encouragement and ease of widespread and comprehensive communication and sharing among students and their teachers. Contextualizing the learning by utilizing RFID-sensor interaction-mediated customization of the learning process according to predefined setting proved that it is wonderful tool toward providing one to one tutor paradigm fostering multidisciplinary education.

Keywords: Multidisciplinary education, web 2.0, mobile learning, ubiquitous learning.

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INTRODUCTION

Currently students use web 2.0 technologies (facebook, tweeter, blogs, youtube etc) extensively. They use these applications in social collaboration and communication but rarely for educational purposes (Crook & Harrison, 2008). The power of these applications in enhancing collaboration and information sharing make it very good opportunity for educational practices. Many researches explored the use of these applications in pedagogy (Charnigo& Barnett-Ellis, 2007; Hewitt & Forte, 2006; Mathews, 2006; Mazer, Murphy & Simonds, 2007; Selwyn, 2007; Towner &VanHorn, 2007). The good thing about these applications is that it merged with their lives seamlessly where students start accessing these applications using their hand held devices (e.g. mobiles phones) (Boyd & Ellison, 2008).

Multidisciplinary education means collaboration of group of specialists from different specialities in teaching group of students in one discipline hiding common and shared objectives. In contrast, interdisciplinary education is the merge of more than one discipline to produce one new discipline having features build up from these different disciplines.

Multidisciplinary education serve in decreasing the gap between what students learn (learning objectives) and what they should do after graduation (learning outcomes).

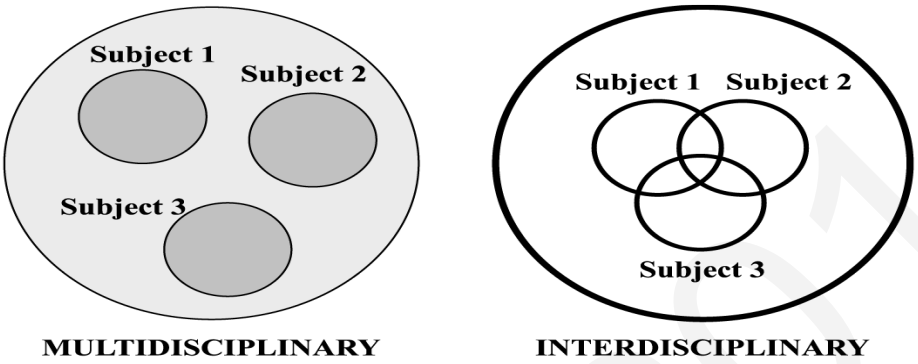

Fig 1.Multidisciplinary education versus interdisciplinary education.

Other benefits of this type of education are:

Communication, mutual understandings between professions, confidence in role and impact on practice.

However, there are number of challenges hindering the application of this type of education. Some of these challenges are :

1- Lack of funding
2- Access to library and IT facilities
3- Bringing different health professionals together
4- Finding a common language to communicate ideas
5- Trusting research you have not skills to access yourself
6- Understanding the concepts underlying a discipline other than your own.

Among those challenges "Bringing different health professionals together" seem to be the most debilitating one and it is the one in which the web 2.0 can offer and advantage (Lampe, Ellison &Steinfield, 2006).

Web 2.0 offers a lot of educational tools which may support multidisciplinary education by providing the following (Hewitt & Forte, 2006):

1- Collaborative learning
2- Information sharing
3- Communication facilitation
4- Group projects
5- Engagement
6- Participation
7- Content development.

Pharmacy profession deals with the wise use of medication in treatment of diseases. It requires knowledge, attitude and skills that are shared between medicine, nursing, laboratory and chemistry specialties.

Pharmacy students struggle usually with the new challenges when working in the real environment. This is because they have been taught by pharmacists who are sometimes not aware about the subtle tasks embedded in the different specialties. However, when only some time elapse they acquire the practical competencies by interacting with different specialists in different disciplines.

Therefore, it will be efficient to overcome the frustration of the new graduants in the real life practice by bringing other specialists together with pharmacists to teach and train pharmacy students the complex skills that may need the expertise of the other disciplines.

HOW SOCIAL NETWORKING AND WEB 2.0 SUPPORT PHARMACY STUDENTS' MULTIDISCIPLINARY EDUCATIO

The utilization of the powerful tools of Web 2.0 early during the curriculum design with critical objective planning shared with all thedifferent professional involved in the multidisciplinary education.

Role Of Social Network And Facebook In Supporting Multidisciplinary Education:

Social networking systems allow users to describe themselves and their interests, and they generally implement notions of friends, ranking, and communities. The ability to record who one's friends are is a common feature that enables traversal and navigation of social networks via sequences of friends. Ranking and communities are more selectively implemented. Ranking of user contributions by community members allows for reputations to be built and for individuals to become members of good standing; this can be an important motivator for the individual contributions that make for a thriving community. The ability to create sub-communities allows for nurturing and growth of sub-community interests in an environment that provides a degree of insulation from the general hub-bub of system activity.

Facebook.com, MySpace.com, and LinkedIn.com are examples of popular social network sites. While all of the Web 2.0 applications discussed here can be considered social in nature, social networks are specifically designed to connect individuals and primarily organized around people, not topics or interests. Facebook is usually the most recognized social network within academic circles, primarily because it was initially developed for and oriented toward college students.

Facebook is equipped withbulletin boards, instant messaging, email, and the ability to post videos and pictures. Mostnotably, anyone can post information and collaborate within the system. Recently, Facebook hasopened up development of downloadable applications, which can further supplement the educational functions of Facebook. While many of these technological tools mirror those foundin currently employed courseware programs (e.g. blackboard, moodle, etc.), the ability and easewith which an individual (instructor or student) can upload photo and videos, the frequent andseamless updates and maintenance, the generous 1024 MB limit on videos, and the compatibilitywith a wide variety of web browsers are superior to some courseware options (Baker, 1999). Facebook provides instructors opportunities and structures by which students can help and support one another by building their courses atop the community already established by the students themselves. Hamann and Wilson (2002) found that students who participated in a web-enhanced class outperformed those students in a traditional lecture format.

Facebook also increases both teacher-student and student-student interaction in the form of web-based communication. Facebook helps instructors connect with their students about assignments, upcoming events, useful links, and samples of work outside of the classroom.

Students can use Facebook to contact classmates about questions regarding class assignments or examinations as well as collaborate on assignments and group projects in an online environment.

Teachers from different specialties can help students to create their own Facebook accounts and become friends. This will create a friendly environment among teacher and students and by this way teacher can share classroom lectures, assignments, events, various academic quizzes, quick tips etc. in a more interactive way.

Any queries or doubts among students can be answered in a no time. Also use of social networking sites such as Facebook in academic education would encourage students to consider.

Blogs Support To Multidisciplinary Education:

Blogs also can be utilized in the multidisciplinary education. It provides a space where teachers and students can work to further develop writing or other skills with the advantage of an instant audience. Teachers can offer instructional tips, and students can practice and benefit from peer review. They also make online mentoring possible. For example, a class of older students can help a class of younger students develop more confidence in their writing skills. Students can also participate in cooperative learning activities that require them to relay research findings, ideas, or suggestions.

Blogs can be use in classroom environment for diary entry; it also can be a useful tool to link communication between study groups within a class or other classes or even schools. If use effectively, blogs can create a learning environment that extend beyond the schoolyard.

There are numerous educational benefits of blogs. Blogs are:
• Highly motivating to students, especially those who otherwise might not become participants in classrooms.
• Excellent opportunities for students to read and write.
• Effective forums for collaboration and discussion.
• Powerful tools to enable scaffolding learning or mentoring to occur.
Blogs can serve at least four basic functions.

1. **Classroom Management**
2. **Collaboration**
3. **Discussions**
4. **Student Portfolios**

Usefulness Of Wikis In Multidisciplinary Education:

Wiki is web server software that allows users to contribute content. One can freely create and edit wiki page contents. Collaboration is the key to Wiki, unlike forums, blogs and social networking sites where only registered member can post, here in wiki all users are allowed to contribute and edit the existing contents. As anyone can contribute and edit wiki so this opens the concept to abuse and misguide, but still most wikis are open. Wikis allow web pages to be written, edited and created collectively in a web browser and it supports hyperlinks and simple text.

Since wiki is free, allows everybody to create and edit pages, being the giant internet digital library and due to providing of unlimited storage space it can be a great tool for education. It can encourage group social interaction and collaboration and group social interaction is the most effective way to learn something. Due to its ease of editing, it can be very helpful for collecting data for a group of students by experts from different disciplines. Different professionals can monitor, edit and correct contents built by students. By such mentoring each professional expert can manage the content related to his specialty very easily with the need to leave his place of work. He can post questions, encourage discussions and answer questions easily.

All professional experts can meet and their meetings and planning can be coordinated right on wiki. Wiki page may include different professionals' norms and activities and a link to all their meeting notes, agendas, documents, and materials.

All the materials which need multidisciplinary educators can be posted right on the wiki and using the discussion tab, teachers can connect and collaborate. Some examples of utilizing blogs and wikis in pharmacy multidisciplinary education are presented in table 1.

Table 1. Suggestions of using Wikis and blogs in pharmacy multidisciplinary education.

Subject	Topic About Activity	Specialist involved
Pharmacology	Real clinical limitation with the use of drugs	Pharmacist, Physicians and nurses
	My on side effects of drugs	Pharmacist, Physicians and nurses
	Warnings for My on drug lab interactions	Pharmacist, Lab specialist
Pharmaceutical administration	Discussion about pharmacy ethics	Pharmacist, Social specialist, health administrator
	Pharmacy laws	Pharmacists, health care administrator, health care certification specialists
Pharmacists	Incompatibility during drug formation	Pharmacists, chemists, Pharmacy factory practioners

The faculty advisors and the other professional can also brainstorm lesson ideas and posted all the lesson topics on the wiki, then faculty advisors signed up for the lesson they were writing by placing their name next to it and posting their lesson. Each advisor wrote one or two lessons leading to instantly creation of bank of lessons accessible to all.

Podcast's Role In Pharmacy Multidisciplinary Education:

The term *podcast* is derived from the combination of 2 words: iPod and broadcast. Podcasts are audio recordings, usually in MP3 format, of talks, interviews and lectures, which can be played either on a desktop computer or on a wide range of handheld MP3 devices. Podcasts are already being used in pharmacy school curriculum. Meng describes many educational applications of podcasting and videocasting, including:

- Podcasts can be used to provide introductory material before lectures, or, more commonly, to record lectures and allow students to listen to the lectures again, either because they were unable to attend, or to reinforce their learning. Podcasts can be used to make lectures redundant while still supplying (possibly didactic) presentations of learning material by lecturers.
- Podcasts can be used to supply audio tutorial material and/or exemplar recordings of native speakers to foreign language learners.
- Distribution and sharing of educational media and resources.

Podcasting can be used for archiving and distributing lectures in video or audio format. It can especially enhance the learning experience in demanding hands-on educational environments such as in medicine (Boulos et al, 2006). Although such podcasting uses are closer to traditional passive learning and web paradigms, they can free class time to be used for problem-solving, project sessions and other active learning activities (Kurtz et al, 2007). An example of using podcasting to support collaborative and active learning can be found in the initiative of the Duke University, where podcasts are created both by teachers and students, covering not only formal educational material, but discussions as well as feedback comments on assignments etc. (Belanger, 2005). A number of medical professional associations and other related bodies are increasingly distributing educational podcasts, while many scientific medical journals are now offering content in the form of podcasts (Agrawal, 2007; Wilson et al, 2009). Podcasting may be of potential volume for Pharmacy students multidisciplinary education (Figure 2.)

Figure2. Suggestions for using Podcasts for multidisciplinary education.

RSS Involvement In Multidisciplinary Education:

RSS is a technology that is being used by millions of web users around the world to keep track of their favorite websites.

Academia has embraced RSS as a means to educate, but scrutinizing how educational institutions are using RSS feeds in their daily routines show RSS is utilized can vary across different industries.

1. Share Resources
Academics are using social bookmarking websites to share quality websites that relate to their area of expertise with colleagues and students.
2. Class Blogs
From elementary schools to university blogs, online journals have flourished. Instructors have used blogging as a teaching tool. Helping students learn writing and reporting skills while understanding how to use technology. Many educational bloggers use RSS as a means to syndicate blog posts.
3. School Schedule
RSS feeds can be used to communicate events scheduled on or off campus to prospective and existing students. Subscribes of a schools calendar feed receive notification as new items are added to the calendar.
4. Podcast Lectures
Podcasts can be used as study guides or even as class preview for students contemplating their course selections or choice of professors.

1. Pronunciation of drugs names by native English language speakers.
2. Lectures on new advancements on drug use from specialized international discovery labs.
3. Subject classes presentation with comments from other specialists.
4. New high authority announcements related to drug holding or obtain.
5. Detailed discussion of precisely briefly discussed complex task from highly specialized experts.
6. Heart murmurs or chest wheezing with physician's comments of pharmacy costs.
7. Description of theoretical parts of lab experiments.
8. Narrations of pharmacy laws and comments from physicians, nurses and health administrators about some pharmacists violations

5. Monitor Research
Students involved in cutting edge research projects can use RSS to monitor news and search engines for specific keywords (like nanotechnology or cold fusion) by creating search feeds. Any time a mention of the keyword phrase occurs in a news piece the item will appear in the search feed.
6. Medical Education
A study recently showed medial students who listened to heart murmurs on an iPod, were more likely to accurately diagnose heart murmurs accurately in patients. Some medical schools have begun adopting podcasts as a means to educate.

Can Twitter Do Any Support To Multidisciplinary Education?

Actually Twitter is an extremely simple platform for friends and co-workers, etc. However, some people even said that it is useless. Just because of that, Twitter has provided us a bigger space for imagination which can make the micro-blogging service be a protocol instead of a platform. Currently, as a standard Internet real-time communication protocol, Twitter has lots of useful features for education too. Students and teachers are able to send replies or DMs to post questions to teachers which means it a real-time two-way communication. As a protocol, an online quiz application can be created based on Twitter. This simply means that the teacher can send quizzes to students through Twitter and students can answer them via the service too. This is also known as a new concept for real-time communication.

Social Bookmarking And Pharmacy Multidisciplinary Education:

Some individuals may like more people to be able to see and remark on the blog post. They could do this by submitting the blog post to a social bookmarking site like Del.icio.us. Social bookmarking sites are Web sites that allow shared lists of user-created Internet bookmarks to be displayed and commented on. Social bookmarking sites allow you to organize your bookmarks by allocating a number of 'tags' to them. This makes it easy for other people who may be interested in a particular group to find related bookmarks. For example, if the tag 'medicine reviews' was added to a bookmark, people searching the bookmark site for 'medicine reviews' information could easily find it.
Social bookmarking applied to the classroom focuses on creating a community of shared sites. There are 5 potential uses of social bookmarking in higher education: (Barsky E, Purdon)

- Acting as a storage location for links.
- Acting to connect individuals with similar interests.
- Examining tagging patterns to identify new research avenues.
- Facilitating group exercises by allowing each person to bring his/her perspective through tagging.
- Tracking student progress by examining site and tag libraries.

Numerous opportunities exist for pharmacy educators to utilize social bookmarking in pharmacy multidisciplinary education. Instructors from different specialties may elect to create a shared bookmark library site that serves as a resource to students during a project or course explaining one idea but from different prospective. To engage students in resource creation, a component of a project may require students to create their own library of tagged sites to support the project. In addition to serving as an output of the project, the sites and tags can serve as part of the summative evaluation in determining the student's grade. For projects, courses, or other longitudinal efforts, periodic review of students' social bookmarks can aid in formative assessment to serve as a teaching tool.(Alexander B. Web 2.0)

The educational uses of social bookmarking lie in the heart of multidisciplinary education of Pharmacists.Teachers and learners can build up collections of resources, and with a little ingenuity can also use social bookmarking systems to bookmark resources for one topic from different disciplines that are not on the web.In this way it is easy to build up reading lists and resource lists. These may, with the use of multiple tags, be structured into sub-categories. Groups of users with a common interest can team together to use the same bookmarking service to bookmark items of common interest. If they have individual bookmarking accounts, they all need to use the same tag to identify their resources. This will minimize the effort of the instructors from different disciplines, since they can build resources for students in their disciplines. These resources can be tagged by students from other resources.

Youtube And Social Videos In Pharmacy Multidisciplinary Education:

As the largest Social Website in the world (According to the Alexa Rank), YouTube, as a video sharing website, plays an important role in enhancing our experience on the Web. Of course, videos can help a lot in

education too. The typical usage of videos is to enable teachers to record education-related videos and students are able to watch them on YouTube itself without the need to travel apart to reach the specialized instructor. As a good interactive way of communication, video communication can also be the future of multi-media communication too. Now the entire world has access to YouTube and other social video sites like Google Video (http://video.google.com). (Educause Learning Initiative.)

These sites are extremely popular, with YouTube streaming 100 million videos per day compared to 20 million unique monthly users 2 years ago. The majority of videos are comical in nature and are less than 2 minutes in length. Finding useful videos for pharmacy instruction may require considerable searching. That is why such tools may help multidisciplinary education. Since you may find many videos related to Pharmaceutical sciences posted by non Pharmacy specialist. These videos are in most time very valuable for Pharmacist to understand complicated Pharmaceutical skills. An analysis of the first 20 videos identified when searching for the term "pharmacy" (on October 20, 2008), revealed the 14th video as the first one of educational value. That American Society of Health-System Pharmacy video discusses the opportunities gained by completing a pharmacy residency. With sufficient time applied to diligent searches, instructors can identify other useful videos. Because of agreements with media outlets, current news stories related to healthcare issues (eg, latest news reports on medication error research) are frequently posted on YouTube. Alternatively specialist from different disciplines can agree to create and post their own videos based on their own disciplines for their students to review, reinforce concepts taught in class, or introduce new concepts. Additional activities may require that students participate in an online (or in class) discussion about the video. A common belief suggests that the best way to learn is to teach. Therefore, a course project might involve pharmacy students developing, recording, and posting a video to demonstrate concepts or skills from a course and being discussed and evaluated by multidisciplinary specialists . Other activities could involve students participating in a role-playing scenario that is posted online for discussion and collaboration with the class and instructor. From a different perspective, an activity could require that students search for, identify, and evaluate online videos for quality and usefulness for predetermined situations.(USA Today)

Virtual World. Can It Be Of Help In Pharmacy Multidisciplinary Education?

A virtual world is a computer-based, simulated multi-media environment, usually running over the Web, and designed so that users can 'inhabit' and interact via their own graphical self representations known as avatars. Linden Lab's (http://lindenlab.com/) Second Life (http://slife.com/) is perhaps the most popular virtual world platform in use today.

The population of Second Life has been doubled since January 2007, and, was at 2nd May 2007, has reached more than six million virtual citizens or 'Lifers', all with their own fully textured high-resolution avatar that can be finely customized to the nth degree. Three-dimensional (3-D) virtual worlds like Second Life can be considered as 3-D social networks, where people can collaboratively create and edit objects in the virtual world (like a collaborative 3-D wiki space), besides meeting each other and interacting with existing objects.(Coffman T, Klinger MB. Utilizing virtual worlds in education)
The potential application and implications of Second Life and other virtual worlds in education environments are abundant. If used correctly, virtual worlds can provide constructivist learning experiences in which students immerse themselves in discovery and investigative activities. Students can be challenged to learn through applied activities, rather than only passively through class lectures. Developers and educators have taken advantage of virtual world applications to provide training and education in areas such as emergency preparedness, risk management, AIDS, and a host of other healthcare-related issues.(Boulos MNK, Ramloll R, Jones R, Toth-Cohen S.). The PULSE!! project (http://www.sp.tamucc.edu/pulse/home.asp, Texas A&M University, Corpus Christi) is one such application that uses high-fidelity virtual worlds to educate medical personnel through online, case-based training.(Hansen MM. Versatile, immersive, creative, and dynamic virtual 3-D health care learning environments). An example of virtual-world use in pharmacy education involves students playing the roles of patient and pharmacist in a Second Life rendition of a real-world family

practice center. Students virtually interact with each other in case history exercises, while simultaneously becoming more familiar with the surroundings of the center.(University of North Carolina Information Technology Services).Such opportunity is of great support for multidisciplinary education. Pharmacy students can virtually practice Pharmaceutical skills under supervision, guidance, support and evaluation of specialist from different disciplines each of whom stemming from his/her own disciplines. This chance is very difficult to be found except in virtual world when specialist nee not to travel away from their work places or even free themselves from their daily duty obligations.

CONCLUSION

Web 2.0 will have profound implications for learners and teachers in formal, informal, work-based and lifelong education. Web 2.0 will affect how universities go about the business of education, from learning, teaching and assessment, through contact with school communities, widening participation, interfacing with industry, and maintaining contact with alumni. Just as the chalkboard, television, personal computer, and Internet were once considered innovative technologies for teaching and learning, Web 2.0 has the potential to alter educational processes. While it would be incorrect to assume that all students of this generation are comfortable and fluid with Web 2.0 technologies, one can safely assume that a large percentage of these students would possess a general comfort level.

One positive aspect of Web 2.0 applications is that they create a participatory architecture for supporting communities of learners.(Brown JS, Adler RP. Minds on fire: Open education). Unlike learning management systems (which are closed systems) and static Web pages (which are singular-owned), blogs, wikis, and social bookmarking sites are open to learners from multiple schools and facilitate collaboration on content creation from multiple disciplines. This participatory culture is, in essence, a key component of Web 2.0 in supporting multidisciplinary education of pharmacists. It is only helpful in facilitating involvement of specialist from different disciplines but also provide authentic education and promote confidence in learning and provide more precise evaluation and assessments.

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SCHOOL ADMINISTRATORS, ICT COORDINATORS AND TEACHERS' METAPHORICAL CONCEPTUALIZATIONS OF TECHNOLOGY

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Abstract

The purpose of this study is to investigate the perceptions of school administrators, ICT coordinators and teachers about technology concept. 87 participants completed the prompt "Technology is like…because…" by focusing on one metaphor about technology. Qualitative and quantitative techniques were used to figure out the metaphor categories and whether they differentiate according to participants' title, gender and age. Content analysis was used to analyze the perceptions of the participants. Findings of the study showed that the participants indicated 60 valid metaphors which were grouped into five categories: 1) Technology as a changing and developing entity (e.g. children, fashion); 2) Technology as a facilitating means (e.g. key, organ); 3) Technology as a needed entity (e.g. food, air); 4) Technology as a useful and harmful entity (e.g. viruses, sugar); 5) Technology as a diffusional entity (e.g. octopus, ocean). It was found that the majority of metaphorical conceptualization categories aligned with "a useful and harmful entity" by administrators, "a facilitator" by ICT coordinators and "a changing and developing entity" by teachers. The perceptions of the participants were also analysed according to title, gender, age variables. The findings of the quantitative analyses showed that there were no significant differences among the participations' perceptions of technology regarding to gender, age and title.

Key words: Technology, metaphor, administrators, ICT coordinators, teachers

SCIENCE AND TECHNOLOGY EDUCATION STUDENTS AS BLOG PUBLISHERS: EFFECTS OF EDUCATIONAL BLOGGING ON PERCEPTIONS OF THE STUDENTS TOWARD WEB AS A LEARNING TOOL

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ABSTRACT

The purpose of this study is to investigate effects of educational blogging on perceptions (e.g., attitude, self-efficacy) of undergraduate students in the Science and Technology Education program toward Web as a learning tool. In addition, this study examines opinions of the students about contribution of educational blogging to the students' perceptions toward Web as a learning tool, knowledge in the field, and advantages and disadvantages of blogging in science education. The methodological frame of this study is based on both one group pre-test and post-test method, and qualitative approaches including observations, interviews and document analyses. A total of 32 undergraduate students voluntarily participated in the pre-test and post-test sections, and 25 students participated in the interviews. The findings indicate that educational blogging had positive effects over the students' attitudes on the usability, self-efficacy, affective and Web-based learning subscales. In addition, the qualitative findings indicate positive contributions of educational blogging to to the students' knowledge in the field, and to the perceptions and thoughts of the students toward Web as a learning tool.

Keywords: Educational blogging, perceptions, science and technology education students, interviews.

INTRODUCTION

A blog, or Weblog, is an easy-to-use Web-based technology that allows users to deploy text and other media (e.g., visuals, audio-visuals, etc.) immediately to the Web (Kelley, 2008) without sophisticated Web design skills. Students have increasingly used blogs both as personal commentaries and as a required part of certain courses (Educause Learning Initiative, 2005). Understanding why people accept or reject information technology has proven to be one of the most important and challenging issues in information system research (Davis et al., cited in Liaw 2002a). Also, according to Liaw (2002b), understanding learners' perceptions of information technology is useful and necessary before or during their use of it as an assisted learning tool.

Prior studies (e.g., Liaw 2002a; Liaw 2002b; Teo, Oh, Liu, 2003) investigated different aspects of the individual Web use (e.g., perceptions including attitudes, and self-efficacy, effects of design features on web attitude) and blog use (Hsu & Lin, 2008). According to Liaw (2002a), individual computer and Internet experience, self-efficacy, motivation, enjoyment and usefulness and are all key factors for individual use of the Web (Liaw, 2002a). Moreover, the results of Teo, Oh and Liu (2003) study suggest that increased level of interactivity on a Web site have positive effects on user's perceived satisfaction, effectiveness, efficiency, value, and overall attitude toward a Web site. In addition, regarding blog use, the results of Hsu and Lin (2008) study indicated that ease of use, enjoyment, and knowledge sharing were positively related to attitude toward blogging.

Although prior studies have investigated different aspects of perceptions or attitudes of students toward Web and blog uses, effects of educational blog publishing on perceptions of students toward Web as a learning tool have not been sufficiently investigated. Thus, this study focuses on effects of educational blogging on perceptions (e.g., attitudes, opinions) of undergraduate students in Science and Technology Education program toward Web as a learning tool.

Purpose of the Study

The purpose of the study is to investigate effects of educational blog publishing on the science and technology students' perceptions (e.g., attitudes, opinions) toward Web as a learning tool. In particular, this study explores whether there are any significant differences between mean attitude scores of the students on usability, self-efficacy, affective (Liaw 2002a) and Web-based learning subscales (Tekinarslan, 2009) of the Web attitude scale (WAS) before and after the educational blogging activities. Furthermore, this study investigates opinions of the students about contribution of educational blogging to their perceptions toward Web as a learning tool. Also, it investigates opinions of the students about contribution of blog publishing to their knowledge in the field, and advantages and limitations of

educational blogging in the field of science and technology. Specifically, this study explores the following research questions:

1. Are there any significant differences between pretest and posttest mean attitude scores of the students on usability self-efficacy, affective and Web-based learning subscales?
2. What are the opinions of the students about contribution of educational blogging to their perceptions toward Web as a learning tool?
3. What are the opinions of students about contribution of educational blogging to their knowledge in science and technology?
4. What are the opinions of students about advantages and limitations of educational blog publishing in science and technology?

METHODOLOGY

The methodological frame of this study includes one group pre-test and post-test method (Büyüköztürk et al., 2008), and qualitative approaches including observations, interviews and document analyses (Bogdan & Biklen, 1992).

One Group Pre-test and Post-test Section

Instruments

A Likert-type Web attitude scale with 21 items was used to collect data in the one group pre-test and post-test section of the study in addition to the personnel information section (e.g., gender, area of study, Internet experience). The first 16 items of the scale were adapted from a Web attitude scale (WAS) developed by Liaw (2002a). The WAS is a valid and reliable scale to measure individuals perceptions' toward Web self-efficacy, liking, usefulness, and behavioral intention to use and learn the Web (Liaw, 2002a), and it has been used in other prior studies (e.g. Akpınar & Bayramoğlu, 2008; Yang & Lester, 2003). The last five items of the scale were adapted from an attitude scale toward Internet-based learning (Tekinarslan, 2008) to measure more specifically the students' attitudes toward Web-based learning. The scale with 21 items was validated and used in Turkish in a prior study (Tekinarslan, 2009).

Participants

A total of 32 undergraduate students (out of 37) in Science and Technology Education program who registered for the Computer II course voluntarily participated in the one group pre-test and post-test section of the study in the Spring semester of 2009-2010 academic year . The students did not have educational blogging experiences prior to this study.

Data analyses

The data collected in the one group pre-test and post-test section of the study were analyzed by using the software of Statistical Package for the Social Sciences (SPSS). The mean scores and standard deviations were calculated for pre-test and post-test. A paired samples t-test was applied to detect the differences between the pre-test and post-test scores of the participants.

Qualitative Investigation Section

Participants

The participants in the qualitative section of the study were the same students in the one group pre-test and post-test section (N=32) of the study. Furthermore, a total of 25 students participated in the interviews through e-mail to provide additional data regarding their blogging applications.

Data collection

A qualitative fieldwork approach which combined multiple data collection techniques such as participant observations, document analyses, and interviews (Bogdan and Biklen, 1992) was applied in the collection of the qualitative data. The participant observations were conducted by the researcher who was the teacher of the course. Thus, he had opportunities for observations in the computer lab when the students create, edit, and publish their blogs related to science education. The researcher took field notes about noteworthy blogging experiences of the students after a period of observation in the computer lab.

Also, the researcher conducted document analysis based on blog pages and contents of the students. The students e-mailed the teacher about the contents and URL addresses of their blogs related to science education. The e-mails and blog pages of the students were electronically documented for document analysis purposes.

Moreover, the researcher was conducted interviews through e-mail with 25 volunteer students who participated in the course and study. The participant students filled out an interview form containing semi-structured questions to reflect their opinions and experiences about blogging in the field of science and technology education. The students (N=25) submitted their interview forms through e-mail attachments in 10 days after the end of the course.

Data analyses

The obtained data including field notes from observations in the computer lab, blogs, e-mails and interview forms were collected in different electronic files. Then, a content analysis method (Bogdan & Biklen, 1992) was applied to analyze the electronic data. All collected data were read and reviewed by the researcher in order to detect the recurring words, phrases, and thoughts. The detected recurring words, phrases, and thoughts were subsequently identified and marked as the initial coding categories, and the unrelated data were eliminated. After that, these coding categories were read again to generate main and final categories of the study. The findings were reported and reflected by considering these main categories.

RESULTS

The results of the study are provided in two sections. In the first section, the results one group pre-test and post-test are presented, and results of qualitative research are presented in the following section.

Results of One Group Pre-test and Post-test Section

Differences on Usability Subscale

The descriptive results in Table 1 show that the pretest mean attitude score ($\overline{X}$ =31.40) of the students is lower than their posttest mean score ($\overline{X}$ =34.28). A paired samples t-test was applied to determine if there was any significant difference between the pretest and posttest mean attitude scores of the students at .05 significance level. The results in Table 2 indicate that the difference between mean scores of the pretest and posttest of the students is significant at .05 level on the usability subscale (t = -2.165, df = 31, p = .038). According to this finding, blog publishing had positive effect over the students' attitudes on the usability subscale of the WAS.

Table 1. Differences between the pretest and posttest mean scores on usability subscale

Groups	N	$\overline{X}$	SD	df	t	P
Pretest	32	31.40	7.11	31	-2.165	.038
Posttest	32	34.28	3.19			

Differences on Self-efficacy Subscale

The paired samples t-test results in Table 2 indicated that there was a significant difference between the mean scores of the pretest ($\overline{X}$ =13.53) and posttest ($\overline{X}$ =15.53) of the students on the self-efficacy subscale (t = -4.228, df = 31, p = .000). According to this finding, posttest mean score of the students is significantly higher than their pretest score. Thus, it can be stated that blog publishing had positive impact on the students' attitudes on the self-efficacy subscale of the WAS.

Table 2. Differences between the pretest and posttest mean scores on self-efficacy subscale

	N	$\overline{X}$	SD	df	t	P
Pretest	32	13.53	3.43	31	-4.228	.000
Posttest	32	15.53	2.15			

Differences on Affective Subscale

According to the paired samples t-test results in Table 3, the difference between the mean scores of the pretest ($\overline{X}$ =14.12) and posttest ($\overline{X}$ =16.15) of the students is significant at .05 level on the affective subscale (t = -3.156, df = 31, p = .004). This finding reveals that posttest mean score of the students is significantly higher than their pretest score. According to this finding, blog publishing positively affected the attitudes of the students on affective subscale of the WAS.

Table 3. Differences between the pretest and posttest mean scores on affective subscale

Groups	N	$\overline{X}$	SD	df	t	P
Pretest	32	14.12	3.68	31	-3.156	.004
Posttest	32	16.15	1.88			

Differences on Web-based Learning Subscale

The paired samples t-test results in Table 4 indicated that there was a significant difference between the mean scores of the pretest ($\overline{X}$ =18.84) and posttest ($\overline{X}$ =21.93) of the students on the Web-based learning subscale (t = -4.695, df = 31, p = .000). According to this finding, posttest mean score of

the students is significantly higher than their pretest score. Thus, it can be stated that blog publishing had positive impact on the students' attitudes on the self-efficacy subscale of the WAS.

Table 4. Differences between the pretest and posttest mean scores on Web-based learning subscale

Groups	N	$\overline{X}$	SD	df	t	*P*
Pretest	32	18.84	4.02	31	-4.695	.000
Posttest	32	21.93	1.66			

Results of Qualitative Research Section

Observations of the Teacher

The students designed and created Web pages through MS FrontPage and MS Publisher, before blog applications. Many students faced notable technical difficulties and problems (e.g., nonworking links, non-openable visuals) when they designed their Web pages through these software (i.e., MS FrontPage and MS Publisher), and they sought help from the teacher to solve these problems.

The educational blogging activities of the students in the field of science and technology were started after they learned simple Web page design in MS FrontPage and MS Publisher. Initially, the teacher showed the students how to open an account, create, edit and publish blog pages in the computer lab. Then, the teacher asked the students create and publish simple blog pages about the topics related to science and technology. A big majority of the students created and published their blog pages with some visuals easily without facing any notable technical difficulties or problems. In addition, blogging activities were enjoyable and favorable for most students in comparison to the web design activities through other software (e.g., M.S. FrontPage).

The students were required to publish educational blog pages which provide information and teach topics in science and technology at least at knowledge and comprehension levels in Bloom's taxonomy. Many students faced difficulties and sought help and ideas from the teacher when deciding and writing instructional objectives and the content based on these objectives although they did not face any notable technical difficulty when they edit and publish their blog pages. In general, most students were able to write the instructional objectives and the content of their blogs after getting ideas from the teacher and benefiting some text books and online resources in the field of science and technology. The students were free to benefit from both online resources and print resources as long as they are reliable. The students in general used online resources when finding digital graphics and images related to their content. But, most students benefited both reliable online and print resources when writing the content of the blogs based on the instructional objectives. Thus, it can be stated that instructional objectives were effective on the students' decisions about whether to use online resources or print resources. Also, many students improved their information searching skills in electronic databases (e.g., Ulakbim) and search engines (e.g., Google, Yahoo, etc.) when they were searching visuals, graphics and information related to their instructional objectives and content of the blogs. Moreover, the students were required to make comments and give feedback about at least two other classmates' blogs. As a result, the students gained experiences about how to make comments, give feedback and state opinions about other classmates' contents on the blogs.

Contributions of Educational Blogging to the Perceptions of the Students

The students were asked, "Has educational blogging made any positive contributions to your perceptions and thoughts about Web as a learning tool? If yes, why?" Most students (17 out of 25) responded "yes" to the question. After they were asked "why", some students (N=7) stated that because they saw that Web based blogs are convenient tools to share information in multimedia format (e.g., visuals, animations, etc.). Also, according to the some students (N=6), blogs provide time and place flexibilities to share and reach information outside of the class. In addition, some students (N=4) responded that blogs give opportunities to comment on the posts and discuss about the topics and ideas in the blog content. However, 5 students did not answer whether blogging has made any contribution to their perceptions and thoughts about Web as a learning tool. Also, 3 students answered "no" to the question. One of the students among them stated that blogging has not contributed to his perceptions and thoughts about Web as a learning tool since the Web is just a tool, and quality of information and skills of information providers are more important than the tool.

Contributions of Educational Blogging to the Knowledge of the Students

The students were asked, "Do you think that educational blogging has made any contribution to your knowledge in the field of science and technology?" Majority of the students (22 out of 25) answered "yes" to the question. After they were asked "If yes, how?" many (N=12) students responded they learned about new information in the field of science and technology when they search and read information to be

used or published in their blogs. Moreover, some students (N=5) stated that they had a chance to repeat and improve their prior learning in subjects of science and technology when they write and edit their blog contents. Furthermore, some students (N=3) stated that their knowledge in the field increased when they read and view the materials (e.g., visuals, videos) on the blogs of the other classmates.
Also, one student noted that she practically learned that how science and technology are related as she is blogging about her knowledge in science education in a concrete manner with various visuals. Additionally, another student noted that he gained experiences and he got ideas about how to benefit and integrate blogs into science and technology education.

Advantages and Limitations of Educational Blogging

The student interviewees were asked, "What are the advantages and disadvanatges of educational blogging for you?" Nearly all students (N=24 out of 25) stated at least one advantage of educational blogging. The most common advantage of educational blogging is its appropriateness for "information sharing", according to the students (N=18). Moreover, 7 students mentioned that blogs enables the publishers to receive comments and feedbacks from the visitors or readers about contents of their educational blogs. Besides, 5 students noted educational blogging increase the corporation and communication among the classmates while they are making comments on their blogs. In addition, according to the 4 students easy to use features without sophisticated technical skills is another advantage of educational blogging. One of the students stated that, "Dissemination of information and opinions from just one source to many people without complicated technical skills is the most important advantage of blogs for me. When become a teacher I can share many information and post announcements to my students easily".

However, three students noted that wrong information and faulty expressions on the blogs can be considered as disadvantages of blogs, although they think that blogs are handy tools to share information. One of the students stated that, "People may create and publish their blogs easily. However, some blogs have a lot of wrong information that lead us wrong directions. This is the only disadvantage of blogs I think". Also, two students mentioned that copy and paste features in blogs may reduce or inactivate creativity and may instigate the students plagiarism when creating the content.

DISCUSSION AND CONCLUSION

According to these findings, it can be stated that educational blog publishing had positive effect over the students' attitudes on the usability, self-efficacy, affective and Web-based learning subscales. Furthermore, the qualitative results revealed that educational blogging made positive contributions to the most students' perceptions and thoughts about Web as a learning tool since the blogs are convenient tools to share information in multimedia format (e.g., visuals, animations, etc.), since blogs provide time and place flexibilities to share and reach information outside of the class, since blogs give opportunities to make comments and discuss about the topics and ideas in the blog content. Although some students (N=3) reflected that educational blogging did not make any contribution to their perceptions and thought about Web as a learning tool, based on the opinions of the majority of the students (N=17) and results of pre-test and post-test results, blogging in general can be considered as useful activity to improve students perceptions and thoughts about Web as a learning tool. Moreover, the findings of this study in regard to perceptions of the students toward educational blogging support the results of a prior study (Kuzu, 2007; Weller, Pegler and Mason, 2004) which indicated that students had positive views, opinions and attitudes toward instructional use of blogs.

In addition, according to the findings, majority of the students thought educational blogging has made positive contributions to their knowledge in the field of science and technology. The students explained that they learned about new information in the field of science and technology when they search and read information to be used or published in their blogs, they had a chance to repeat and improve their prior learning in subjects of science and technology when they write and edit their blog contents, and their knowledge in the field increased when they read and view the materials (e.g., visuals, videos) on the blogs of the other classmates. Thus, based on these findings, it can be stated that blogging in a teaching and learning environment can be used to improve students' knowledge in the field of science and technology. Furthermore, the results of the current study regarding the contribution of blogging to the knowledge of the students are consistent with the prior studies which suggest that blogs can be used to facilitate students' learning (Stiler & Philleo, 2003) and knowledge acquisition (Glogoff, 2005).

According to the findings of this study and related literature, the advantages of the educational blog can be listed as information sharing among the classmates or online learning community (Kim, 2008), making comments and receiving feedbacks from the visitors or classmates (Huette, 2006),

potentials for corporation and communication among the classmates (Wang, Hsua, 2008), and easy to use features without sophisticated technical skills (Duffy & Bruns, 2006).

To conclude, the results of pre-test and post-test procedure suggest that educational blogging is an effective activity to promote students perceptions or attitudes toward Web as a learning tool. In addition, the qualitative results supports the results of pre-test and post-test procedure by revealing positive contributions of educational blogging to the perceptions and thoughts of the students toward Web as a learning tool. Also, the qualitative results suggest that blogging for educational purposes make contributions to the students' knowledge in the field. Thus, educational blogging can be considered as a convenient activity to improve the students' perceptions toward Web as a learning tool, and to enhance the knowledge of the students in fields such as science and technology.

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SEE THE UNSEEN (DENTAL STUDENTS' PERCEPTION ON CLINICAL PAIRING)

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Abstract

In a study done by George (2000) cooperative learning is defined as the obtaining of knowledge in a setting involving more than one student. On the other hand, Jacobs and Ward (2000) identified it as a combination of styles used by learners and their peers in order to improve the learning process. Dentistry is a branch of medical field that incorporates cooperative learning as part of its clinical course. Since cooperative learning can be used with other instructional strategies and altered to cater to different subject areas, clinical pairing can be viewed as its implementation. Studies are being conducted to show the scholar's concerns about the consequences that assists/hinders the clinical teaching in health care program. Therefore, it is indicated that clinical teaching is equally important as the theory part taught in a class by lecturers. Most dental students are usually subjected to experience clinical pairing since clinics are an inseparable part of the health related/medical major's curriculum. Current study aimed to assess the student's perception on clinical pairing in dental settings. The sampling method for this study is convenience sampling. Participants were year II and III dental students. Findings indicated that majority of the students have the knowledge on why the clinical pairing was introduced but interestingly they still prefer to work alone which indicate that students' acceptance level of Clinical pairing implementation is low.

Key words: clinical pairing, cooperative learning, clinic environment, cooperation

INTRODUCTION

Concept of Cooperative Learning

In a study done by George (2000) cooperative learning is defined as the obtaining of knowledge in a setting involving more than one student. On the other hand, Jacobs and Ward (2000) identified it as a combination of styles used by learners and their peers in order to improve the learning process. Although it is referred as the settings or the styles in obtaining knowledge, Hall (2006) stated cooperative learning as the situation in which learners with a common target work together to achieve their goal or in other words, sharing the experiences with the peers who have similar learning goals.

Cooperative learning is one strategy which has a strong foundation in research. (For reviews, see Cohen, 1994; Johnson & Johnson, 1987, 1999; Slavin, 1995). The cooperative learning potential is also apparent to researchers; its advantages and disadvantage are globally well known (Ding, Xiaobao, & Kulm, 2007). Berkowitz and Bier (2003) stressed that cooperative learning "whether assessed in isolation or as part of character education initiative will result in better conflict resolution skills, greater cooperation ,and higher academic achievement, among other outcomes" (Berkowitz, 2003, p. 13). These findings suggest that cooperative learning promotes learning regardless of the subject area making it easy to adopt or modify to fit in with other modes of instruction. Furthermore, Johnson (1997) claims that CL is one, if not, the best – researched approaches in education. For example, one study on CL reported that content based language instruction was amenable to CL (Chamot & O'Malley, 1994).

Cooperative learning in dentistry

Dentistry is a branch of the medical field that incorporates cooperative learning as part of its clinical course. Since cooperative learning can be used with other instructional strategies and altered to cater to different subject areas, clinical pairing can be viewed as its implementation. Studies are being conducted to show the scholar's concerns about the consequences that assist/hinder the clinical teaching in health care programs. Therefore, it is indicated that clinical teaching is equally important as the theory part taught in a class by lecturers. The prospective of proper cooperation between these 2 categories (curriculum) can produce proper graduates in any dentistry school. Most dental students are usually subjected to experience clinical pairing since clinics are an inseparable part of the health related/medical major's curriculum. This cooperation between the theory and clinical teachings and activities can be considered as cooperative learning in dentistry.

One of the advantages in cooperative learning is the concept of its critical thinking and skills improvement which happens by learning from one another (Jbeili, 2003). This concept of cooperative learning is practiced as a clinical pairing in dentistry. Clinical pairing can be considered as a kind of cooperative learning, because in clinical pairing, interdependency, learning from each other and working in small group for common goals are the basic pillars. George (2000) indicated that these three concepts are among the important concepts of cooperative learning. Cooperative learning also enhanced student performance when used in teaching dentistry, chemistry, sociology, race relations and computer skills (Kogut, 1997; Maier & Keenan, 1994). Literature indicated that cooperative learning will increase students' tolerance of others in terms of different races/cultures in the learning environment.

Qualtrough (2001) indicated that the clinical pairing is not a new concept in dentistry. Clinical pairing refers to a situation in which two students are involved in the clinic; one treats the patient while the other assists him or her. The exchange of knowledge between the operator and assistant will improve the treatment procedures. An earlier study by Hodgson (1975) cited in Qualtrough (2001) stated that the clinical pairing was practiced due to the insufficient number of dental nurses to assist the students but later it turned out to be useful in several ways. This clinical pairing can be the source for early practices of "assistant

procedures", "shorter" appointment will be assigned for the patient visit and finally there will be sufficient use of the space. There are many other benefits which can be gained from this cooperation between the operator and assistant. Students believed that one of the positive products of this cooperation is the dentist-patient relationship from the "objective" point of view.

Objective of the study

1. To assess students' perception on clinical pairing in dental setting.

METHODOLOGY

This research is part of an ongoing educational research conducted by the Department of Conservative Dentistry, University of Malaya. It is aimed at evaluating students' perception on the four handed dentistry concept.

The sampling method for this study is convenience sampling. The study population was 148, year II and III dental students, University of Malaya. These students have experienced both the double and four handed dentistry.

In order to achieve the study objectives, quantitative approaches were employed to achieve optimal results. A questionnaire was designed by lecturers in the Faculty of Dentistry and validated. The instructional review board at the Faculty of Dentistry, University of Malaya reviewed and approved the survey as well as other related documents. All lecturers in the department were briefed on the procedures and the questionnaires were then distributed to the students.

The questionnaire comprised 4 questions designed to extract the relevant information on students' perception on clinical pairing. This survey is the combination of open ended question and questions with 7-point Likert scale (from 1 = not satisfactory to 7 = very satisfactory).

The survey starts with investigating students' knowledge and their reasons for agreeing or disagreeing with clinical pairing. The researchers decided to categorize the data into 6 main themes namely: work related (Q), patient related (PT), partner related (P) Lecturer related (T) Infection control (IC) and leaning environment (L). Table 1 displays the themes in detail. All the data were entered into the SPSS program; all the aforementioned themes were defined by the researchers. The following are the definition by the researchers:

Table 1. Coding System for data analysis

Themes	Definition
Learning environment(L)	The use and organization of the clinical setting in four-handed dentistry during daily practice, its practicality and the social atmosphere. It includes following dimensions: Practicality, Real life situation, Four-handed dentistry, Teamwork, Assimilate real life clinical situation, Practicality of four-handed dentistry
Patient related	Patient related refers to student-patient relationship and all associated issues. It comprises: Patient, Satisfaction, Patient issues, Relationship between student-patient
Infection control	Infection control refers to all issues related to procedures, practices and techniques in preventing spread of infections, including all issues
Lecturer related	Lecturer related refers to student-lecturer relationship and all associated issues including Student perception toward the lecturers in practicing four-handed dentistry. Including Student –lecturer relationship, Student perception toward the lecturers

Partner related	Partner related refers to student-student relationship in clinical pairing and all associated issues. Including Communication, Time management
Quality related	Quality referred to standard of clinical performance, measurement of productivity and clear documentation of clinical management. It covers Productivity, Standard Legislation

RESULTS

Students' knowledge on pairing and reason (s) for its introduction

The following analysis in Table 2 indicated that 93.9% of the students have knowledge on why the clinical pairing was introduced and only 6.1% have no idea about the concept of clinical pairing. When asked to specify the reasons for the introduction of clinical pairing, responses indicated that among the themes defined by the researchers (learning environment, quality related, patient related, infection control related, lecturer related and partner related), the quality related factors (48.1%) ranked the highest followed by infection control (22.4%), learning environment (15.4%), remaining factors were reported less significant (Refer to Table 1).

Table 2 Students' Perceived Reason(s) for Introduction of Pairing

Q2. If the answer to question 1 is yes what are the reason(s)?	
Dimensions	**Percentage**
Quality	48.1%
Infection control	22.4%
Learning Environment	15.4%
Patient related	10.7%
Partner related	2.2%
Lecturer related	1.1%
Total	**99.9%**

Acceptance of clinical pairing

The following Table 3 indicated the students' acceptance level on clinical pairing. Based on Table 3, students' responses to question 3 aimed to rectify students' acceptance level toward the clinical pairing concept. The majority (85.5%) of the students indicated that they are willing to have Friday afternoon session free; that means their preference is to work alone. However only (13.8%) of the class were not willing to work independently and 0.7% did not answer the question.

Table 3Acceptance of clinical pairing concept among the dentistry students.

3. Will you like to have the Friday afternoon session free for you to treat patients without a partner, i.e. all student call patient to treat their own patients?		
Yes	124	85.5%
No	20	13.8%
No Answer	1	0.7%
Missing	3	0
Total	148	100%

Rationale for student preference to work alone

The following Table 4 indicated the students' acceptance level on clinical pairing. Based on Table 4, students' responses to question 4 aimed at identifying their acceptance level toward the clinical pairing concept. Learners believed that the first and most important factor to convince them to accept the clinical pairing is its impact on quality related (55.8%) issues as the highest followed by learning environment (40.1%), partner related (3.3%) and lecture related (1.4%) as the lowest among other factors. Reasons for preferring to work alone were highly dependent on quality issues (55.8%) and learning environment (40.1%) compared to partner or lecturer issues.

Table 4 The Rationale for Clinical Pairing Concept Acceptance Among the Students

4. Please provide some reasons for your response to question 11.	N	%
Quality		55.8%
Learning environment		40.1%
Partner related		3.3%
Lecturer related		1.4%

DISCUSSION

In this study the students' perception toward the clinical pairing was examined among the year II and III dental students. The results revealed that 93.9% percent of the dental students are aware about the reasons why clinical pairing was introduced. Students highlighted the quality related (48.1%) and infection control (22.4%) issues followed by learning environment (15.4%).

Choosing quality related issues as the highest among the other factors indicated that the students are concern about the increasing the efficiency and knowledge sharing, some of the students express their concern about the quality with statement such as "to achieve better quantity of work", "operator can pay full attention to the patient to complete treatment faster" and "better clinical management" and many more and statements such as "we have more opportunities for learning", "to create a better working environment", "to decrease the lecturer student ratio, so the lecturer can attend to the students faster" and "it prepare students to real situations for patient treatment when they go out". Student's rationales for disliking the clinical pairing weigh heavily on partner related issues 45.2%. Students have no interference in their partner selection, the partner can be any one of the student who is assigned by the faculty. Clinical pairing is not a new concept but within the study scope is considered new due to logistics constraints. This study assesses the perception of the students toward the clinical pairing to gauge students' acceptance of clinical pairing if it is being implemented. It also tried to find out what are the shortcomings of the clinical pairing in order to enhance its application.

Majority of the students perceive that they have the knowledge and most of them believed that it improve the quality but interestingly with high knowledge on clinical pairing by students, still nearly 70% of them prefer to work alone which indicate the students acceptance level of clinical pairing implementation is low. It can be hypothesized that students didn't answer the question honestly or the knowledge of the clinical pairing is still lacking. However, this study recommends the further probing into factors that may affect the knowledge and acceptance of clinical pairing among the dental students.

Considering the nature of the clinical pairing, communication is the key factor among the pairs in clinics. If they are unable to understand and cope with each other then the main concept of pairing is not successful which is due to lack of proper communication. The reluctance to take part in clinical pairing can thus be explained by the fact that the students are not allowed to be involved in partner selection.

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STUDENT INFORMATION PRACTICES IN MALAYSIAN HIGHER EDUCATION

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ABSTRACT

This study examined the phenomenon of students learning information skills from the multiple perspectives of Malaysian higher education teachers, librarians and students as they jointly engaged in student information skills programs. Using qualitative research approach, the study observed student information skills programs, examined the programs' teaching and learning resources, and interviewed teachers, librarians and students who were engaged in the programs. The findings suggest that participants viewed students learning information skills as students participating in information practices. The practices consist of students articulating the needs to participate in information practices, identifying information sources, accessing information sources, interacting with information sources, using information from different information sources to reach new understandings, and negotiating the understandings with collaborators of learning. Furthermore the study found that students' participation in information practices is characterized by independent and collaborative ways of students engaging with information sources, information from different sources, collaborators of learning and their prior understandings. The findings are essential to assist higher education communities to transform higher education students into knowledge creators as required by the national education framework.

BACKGROUND OF THE STUDY

Information skills are defined as a series of abilities of identifying the need for information; locating, accessing and organizing information and its sources; evaluating and selecting information and its sources; analyzing and synthesizing information from different sources to create new understandings; using the understanding to accomplish a specific purpose; and accessing and using information and its sources ethically and legally (Association of College and Research Libraries, 2000; Bundy, 2004; Society of College National & University Libraries, 1999). While UNESCO (2006) identified information skills as an extension of reading and arithmetic abilities necessary for individuals and their communities to function and progress, Bundy (2004) attributed the skills to the 21st century university students and lifelong learning. In Malaysia, student information skills programs were first introduced in higher education institutions during the 1990s when the government called for institutions to develop knowledge workers to run the local knowledge economy. Defined as those who are fluent in using information technology, knowledge workers are also known for their ability to access, use, synthesize and construct information (Economic Planning Unit, 2006). Following this requirement, the institutions, via their academic libraries offered student information skills programs to assist students to acquire skills of searching, accessing, and organizing information and its sources. Later, the introduction of the Malaysian Qualification Framework (Malaysian Qualifications Agency, 2007) into the national education system further reinforces students' demonstration of information skills in higher education. In the framework, information skills are highlighted as parts of series of desirable learning outcomes for higher education students to demonstrate, necessary for the students to graduate. The framework also implies that information skills teaching and learning in higher education is moving beyond academic libraries and toward classroom learning.

STATEMENT OF THE PROBLEM OF THE STUDY

Although Malaysian universities have been conducting student information skills programs via their academic libraries since 1990s, a review of literature (e.g., Chan, 2003; Edzan & Mohd Saad, 2005; Mohd Saad &

Awang Ngah, 2002) suggested these programs were focusing on students searching information and its sources. Similarly, Karelse (1998) and Reid (1998) also viewed that the programs were emphasizing students searching and accessing information and its sources using information and communication technology application, while overlooking students analyzing and synthesizing information. These observations suggested that student information skills programs in Malaysian higher education did not follow standards and frameworks for information skills in higher education (e.g., Association of College and Research Libraries, 2000; Bundy, 2004; Joint Information Systems Committee, 2002), which clearly state that students' ability to analyze and synthesize information as parts of information skills. While more studies have been conducted to understand students learning information skills in Malaysian higher education (e.g., Abdullah, Ahmad Kassim, Mohd Saad, Tarmuchi, & Aripin, 2006; Edzan, 2007), these studies focused on assessing levels of information skills among Malaysian higher education students. While these findings are helpful to estimate levels of information skills perceived to be acquired by the Malaysian university students, they are insufficient to collaborate or refute the view that student information skills programs in Malaysian higher education might be different from the established information skills standards and frameworks for higher education. Previous studies such as by (Maybee, 2007), (Kuhlthau, 2004), (Yoon, 2007), (Floyd, Colvin, & Bodur, 2008), (Boon, Johnston, & Webber, 2007), (Bruce, 1997), and (Lupton, 2003) might help us to understand students learning information skills in higher education. However, these studies only examined the phenomenon using a single or dual perspective of those involved in students learning information skills programs. Following the Malaysian Qualification Framework, which implicitly shifts students learning information skills beyond the universities' library and toward the classroom learning, we will gain a better understanding of the phenomenon in the context of Malaysian higher education if we investigate the phenomenon using the multiple perspectives of teachers, librarians and students who are jointly engaged in student information skills programs.

RESEARCH PURPOSE OF THE STUDY

This study investigated the phenomenon of students learning information skills in the context of Malaysian higher education using the multiple perspectives of teachers, librarians and students as they jointly engaged in the phenomenon.

THEORETICAL FRAMEWORK OF THE STUDY

This study employed a social psychological approach to examine the phenomenon of students learning information skills in the context of Malaysian higher education which is drawn from the perspectives of communities of practice (Wenger, 1998) and symbolic interactionism (Charon, 2007). The concept of communities of practice views learning as a process of social participation and identity construction in communities which learners belong to. Following this perspective, the study further assumed the phenomenon is social, conscious and a joint effort between members of different communities in higher education institutions, that is, teachers, librarians and students. As teachers, librarians, and students participate in the phenomenon, they continuously construct, negotiate, and reify knowledge and ways of knowing about students learning information skills in the context of practices of communities that they belong to.

However the study further assumed teachers, librarians, and students are not merely members of different communities; each of them is also a human being with unique ways of thinking, feeling and doing. Accordingly, to highlight personal aspects of those engage in student information skills programs, this study also employed the perspective of symbolic interactionism to guide the understanding of the phenomenon under study. Situated within social psychology (Charon, 2007), symbolic interactionism can be traced to George Herbert Mead, John Dewey and other educators and is identified as one of the approaches to study behaviors of individuals and their communities (Blumer, 1969; Charon, 2007; Robbins, Chatterjee, & Canda, 2006). While communities of practices emphasizes the social aspects of the phenomenon, that is the jointly engagement of teachers, librarians, and teachers in students learning information skills, symbolic interactionism suggests that the phenomenon could be further understood by examining the personal aspects of those engage in the phenomenon, that is their assumptions or beliefs, perceptions and actions (Charon, 2007). Accordingly, this study examined the perception of teachers, librarians, and students about students learning information skills as they jointly engaged in student information skills programs.

RESEARCH QUESTION OF THE STUDY

How do teachers, librarians, and students perceive students learning information skills as they jointly engaged in student information skills programs?

RESEARCH APPROACH AND DESIGN OF THE STUDY

This study employed a qualitative research approach which is defined as qualitative research strategies (Bogdan & Biklen, 2007). These strategies are characterized by real and information rich cases; flexible and emergent research design; researchers' personal engagement and experience; multiple perspectives of understanding the phenomenon; inductive and creative ways of analyzing and synthesizing data; unique findings from cases and overarching findings across cases; as well as locate the findings in social, historical and temporal context where the phenomenon is being studied (Merriam, 2009; Patton, 2002). Although a qualitative research approach have been widely employed to investigate students learning information skills from the perspective of higher education educators and librarians (e.g., Boon et al., 2007; Bruce, 1997; Doyle, 1992), and students (e.g. Lupton, 2003; Maybee, 2007), the approach is yet commonly employed to triangulate the multiple perspectives of higher education teachers, librarians and students as they jointly engage in student information skills programs. Following the study's research approach, this study selected one university in Malaysia as the setting of the study, which offered students information skills programs and provided an access entry for the study to collect data. Working closely with librarians in the university library, the study selected and observed five student information skills programs that were jointly engaged by teachers, librarians and students, and later examined teaching and learning resources of the programs. Both observation and examination assisted the study to develop interview guidelines, which guided the semi-structured interviews with five teachers, four librarians, and 18 students who were engaged in the programs and willing to participate in the study. The study further employed Merriam's (2009) steps for analyzing the qualitative data. Guided by the research question, the study used bucket, open and analytical coding to construct a meaningful "classification system" (Merriam, 2009, p. 180) of students learning information skills, which suggests patterns and regularities for students learning information skills. The study further employed cross-case matrices to identify possible explanations across cases (participants) and sources (program observations, resource examinations, and interviews) to answer the research question. The study also used Nvivo programs in the data analysis process to electronically organize, revise, and retrieve parent and child nodes/codes/categories and their respective references for data from the interviews.

RESEARCH FINDINGS AND DISCUSSION

The study's observation on student information skills programs suggested that students learning information skills are students identifying the needs to engage with information sources, students identifying information sources that help them to satisfy the needs, and students accessing the identified information sources via various searching tools and strategies. Likewise, examination of teaching and learning resources of the programs, such as teaching aids used by the librarians during the programs, student information skills assignments, and the programs' evaluation forms also indicated similar findings. However, interviews with teachers, librarians and students indicated that students learning information skills are about students participating in certain practices, known in this study as student information practices, which students are expected to perform when they engage with information sources, information from different information sources, collaborators of learning, and their prior understanding.

Participants further viewed that student information practices consist of six interrelated practices which begin with students articulating the needs to participate in information practices. Teachers described the needs as "skeleton" of students' inquiry, "questions" of students' classroom assignments, and topics of students' thesis. Similarly, librarians associated the needs with students' research topics or titles, which students should further refine into searchable keywords. Students also associated the needs with topics of their thesis, lectures, and classroom discussions and assignments. Participants viewed students' articulation of the needs is essential to enable students to access information sources relevant to their working topics, as well provide contexts for students to undertake their information practices, such as classroom learning, thesis examination, seminar presentation, and journal publication. The second practice of student information practices is students identifying information sources that will satisfy their needs. While librarians viewed that the identification

should be strictly driven by students' topics and keywords, teachers' and students identify electronic and online information sources, such as journal articles and internet websites, as information sources that students should engage in their information practices due to the currentness of information available in the sources, as well as the sources provide easy, fast, and full text accessibility to students regardless of time and place. Respectively, librarians viewed that their primary task in student information skills programs is to expose students to all information sources available in and subscribed by the library, while teachers and students expected librarians to expose students to information sources that that are easy and fast to access and provide latest and comprehensive information on students' topics of inquiry.

The third practice of student information practice is students accessing information sources that they had identified earlier. Both teachers and librarians associated the practice with students using various gateways for students accessing information sources. Among the gateways identified by teachers and students are the university library, librarians, website and online cataloging system; online and electronic information databases subscribed and developed by the library; as well as open access databases. Particularly teachers associated the practices with students using specific procedures to interact with search engines of the gateways in order to access relevant information sources available in the databases. However, as the university is moving toward outcome-based and self-accessed learning, teachers perceived that interactive, self-accessed and electronic or platform would better inform students about the library collections and ways to access these collections without the need for students to join information skills programs or see librarians at the library helpdesk. Likewise students highlighted that student inaccessibility to online library collection outside the university premises is the reason that limits their access or use of the collection or sources. The fourth practice of student information practices is students interacting with information sources. Given students have access to unlimited number of information sources, teachers, librarians and students associated the practice with students browsing, evaluating and selecting different information sources that really matter to the needs of students' information practices before printing or saving or collecting the sources. While teachers viewed these actions is a linear process, students reported that after collecting the information sources they re-engage in another cycle of students interacting with information sources in order to select information sources that they would use in their information practices.

The fifth practice of student information practices is students using information sources to develop new understandings. Teachers and students associated this practice with students "digesting" or "processing" information from different information sources which consists of students reading, analyzing and synthesizing information from the sources into a meaningful, coherent and systematic "conclusion", "idea" or "understanding". Students reported that this is the most complex practice that they need to perform in student information practices, and suggested that previous experiences or trainings in this practice would help them overcome the complexity. Finally, the sixth practice of student information practices is students negotiating their understanding via developing and presenting the understanding to collaborators of learning via certain artifacts of the understanding. Among the collaborators of learning identified by teachers and students are students' classroom teachers and peers, thesis supervisors, and experts and practitioners in the topics of students' inquiry. Additionally, while teachers listed librarians as one of the collaborators of learning, students did not share the view. Moreover, the study found that students' artifacts of understanding are ranging from students' research writing and verbal presentation for their classroom assignments and activities, students answering their teachers' questions during classroom learning, students answering their final examination, students writing and presenting their thesis for examination, and students writing a research report for journal and conference publication and presentation. One teachers also viewed that students' sitting arrangement in their classroom learning is also constitutes students' artifacts of understanding.

Lastly, the study found that goals of students participating in information practices characterize ways of students participate in the practices. For example teachers associated the goals with transforming students into independent and lifelong learners, scholars, acceptable members of students' discipline of knowledge community, and talented individuals. Similarly, librarians identified the goals with transforming students into lifelong and informed citizens, while students associated the goals with becoming experts in their field of study and contributors to the well-being of their families, and local and workplace communities. However, most students associated their goals with receiving good grades from classroom assignments and final

examination, and completing their university study. Additionally a few students attached the goals with emotional dimensions, such as, they enjoyed to negotiate their understanding during classroom learning and received "exposure" or recognition from the classroom teachers and peers as the result of the practice. Further analysis on these goals suggested that students participating in information practices are characterized by collaborative ways of students engaging with information sources, information from different sources, collaborators of learning, and prior understandings and independently reach and negotiate their new understanding with the collaborators of learning.

CONCLUSION

Students learning information skills are central topics in transforming students into lifelong learners, knowledge creators and members of knowledge society. The discussion above is intended to clarify how information skills are conceptualized collectively by higher education teachers, librarians, and students while they engaged in student information skills programs. The study found that the teachers, librarians, and students viewed student information skills ascertain practices, known in this study as students information practices, that students are expecting to perform when they are engaging with information sources, information from various sources, collaborators of learning and prior understandings. While the study found that student information skills programs focus to students accessing information and its sources as reviewed by previous literature (e.g. Karelse, 1998; Reid, 1998), the study also found that the programs are only parts of students learning information skills. The rest of the phenomenon is located in the students' classroom learning as well as in students' independent and collaborative ways of engaging with information sources, information from various sources, collaborators of learning and prior understandings. The study also found that by emphasizing student information skills as student information practices, we allow students to take charge of their participation in information practices as well as tailor the practices to suit social or personal practices that they are currently engaged with. On the other hand, viewing information skills as practices also complicated the understanding of students learning information skills because the phenomenon could no longer be seen as students acquiring a set of skills or abilities, but students developing and performing certain practices that are seen by teachers, librarians and students as meaningful to students. Respectively, understanding and integrating social and personal practices of those engaged in student information skills programs are the ways to move forward to help students developing information skills in higher education.

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STUDENTS' OPINIONS ABOUT DESIGNING ALGORITHMS ACCORDING TO DIFFERENT INSTRUCTIONAL APPLICATIONS

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Özet
Bu araştırmanın amacı doğrudan bir programlama dili öğretilen ve yalnızca algoritma öğretilen öğrencilerinin algoritma oluştururken yaşadıkları güçlüklere ilişkin görüşlerini ortaya koymaktır. Bu araştırma, sontest kontrol gruplu yarı deneysel hem nicel hem de nitel karakterli bir çalışmadır. Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Bölümü 1. sınıfında öğrenim gören 45 öğrenci, araştırmanın çalışma grubunu oluşturmaktadır. Araştırmanın verileri araştırmacılar tarafından hazırlanan Görüşme Formu kullanılarak toplanmıştır. Görüşme Formu dokuman inceleme yöntemi yardımıyla değerlendirilmiştir. Erişilen sonuçlardan bazıları şöyle özetlenebilir: Öğrencilerin büyük bir bölümü algoritma tasarlama sürecinde güçlük yaşamaktadır. Yalnızca algoritma öğretilen grup, doğrudan bir programlama dili öğretilen gruba göre bir problemin çözümünü planlama ve matematiksel işlemler gerektiren problemlerin çözümü konusunda daha az güçlük yaşamaktadırlar.
Anahtar Kelimeler: Algoritma, Programlama, problem çözme

INTRODUCTION

Individuals who are to work in fields that require knowledge about information technologies, computer training and programming may need sufficient knowledge about computer programming. Since knowledge of programming languages is of great importance for programming skills, programmers should arguably possess a maximum level of knowledge about the characteristics of programming languages. Therefore, it is very important to teach programming skills (Robins et al., 2003) as these skills are regarded as among the fundamentals of both computer sciences, and computer teacher training programs.

Possessing programming skills is also important for a career in the information industry. Thus, although the popularity of the courses of introduction to programming has been on the rise in higher education, failure and disappointment are quite common as acquiring this skill is hard and requires a lot of effort (Dreyfus and Dreyfus, 1986; Winslow, 1996). In fact, Gomes and Mendes (2007) state that problems are experienced in the process of teaching programming skills in terms of academic achievement and students' satisfaction levels. One of the main reasons behind students' failures in programming courses may be the traditional methods commonly used to teach programming languages, and the instruction tools that disregard students' characteristics. In addition, the general lack of knowledge among students about the problem solving process, and about how to design a program or algorithm (Lawrence et al., 1994; Jenkins, 2002), may also lead to failures. Boulay (1986) underlined the importance of problem solving skills in the programming process. Similarly, Spohrer and Soloway (1986), Winslow (1996) and Soloway et al. (1989) stress the fact that many students experience problems in understanding the algorithmic structure in the programming process.

Students' problems in learning programming skills can certainly be attributed to many factors. Chiefly among them is the inherent complexity of the programming process, the tendency to overlook the fact that this process requires special teaching approaches, the need for strenuous efforts to learn, and the lack of skills to use mathematical knowledge in the programming process (Lawrence et al., 1994). Jenkins (2002) listed the main teaching methods that might cause problems in teaching programming skills as follows: 1. The instruction process based on the overall classroom environment, and the lack of one-to-one teaching with students. 2. Instructors who disregard their students' learning styles, and overlook individual learning preferences. 3. The passive attitude in learning environments of students who simply watch presentations or follow what is written on the board. The disregard for students' learning styles in

the learning process may result in learning difficulties for many students (Kolb, 1985), for these students usually prefer active and interactive environments. Furthermore, most teachers tend to base their teaching on memorising verbal presentation of information and details, instead of establishing, and emphasising, a link between algorithms, and problem solving in the process of teaching programming skills, encouraging students to be active, and presenting them with up-to-date examples.

Programming skills can mainly be examined in two categories, which are (a) the perspective of professional software engineering that requires experience and teamwork, and usually aims at large-scale software projects, and (b) the educational-psychological perspective that is rather based on individual learning, and requires program writing skills for a problem with defined limits (Boehm, 1981; Brooks, 1995; Humphrey, 1999). The present study deals with the problems and solutions in individual programming skills or the educational-psychological perspective which influences one's possession of programming skills to solve any defined problem.

Research in the field of education frequently addresses the problems experienced in learning abstract concepts. Such difficulties usually arise since abstract concepts are not adequately associated with real life or are not made concrete enough (Dede et al., 1999). These problems are also frequently experienced in teaching programming skills, and are always found in the programming process which requires multiple abstract operations (Katai et al., 2008).

Various solutions have been offered to overcome the above mentioned learning difficulties experienced by students in acquiring programming skills. One solution for students is to take an introductory course to programming to learn effective algorithm design skills before directly taking a programming course, which could be an effective solution for the problems experienced in teaching programming skills. In other words, prior learning of algorithm design skills is argued to be important for better learning of programming skills (Özdener, 2008). However, although the literature lacks adequate evidence of whether teaching algorithm skills prior to programming training contributes to programming skills, and if it does, what the extent of such contributions is, it could be argued that algorithm designing skills could be important for developing programming skills and those students' possible difficulties in the process of algorithm designing may adversely affect their programming skills. On the basis of this assumption, the present study aims to reveal what students think about the difficulties they have in the process of designing algorithms.

METHOD

The present study is a posttest control group semi-experimental study with both quantitative and qualitative characters. Most of the students in the study groups graduated from general high schools and had no previous training about programming processes. The sample consists of a total of 45 students in their first year in the Department of Computer, and Instruction Technologies in an Education Faculty, of whom 23 are female and 22 are male.

For five hours a week for four weeks, experiment group I was taught the concepts of program, command, algorithm, flow chart, constant, condition and cycle, and example questions were analysed about how to develop an algorithm. The students were presented with explanations and examples about what strategies they should follow in the problem solving process. At every stage of the instruction, the students were made to develop algorithms to solve different exemplary problems and were provided with instant feedback and corrections for their mistakes. At the end of each session, they were given problem statements as extracurricular activities, which they were asked to solve for the next session.

Similarly, for five hours a week for four weeks, experiment group II was also taught the concepts of variable, Visual Basic editor, program, command, algorithm, flow chart, constant, condition and cycle and basic commands in Visual Basic. Next, example questions were analysed about how to develop a program piece. The students were presented with explanations and examples about what strategies they should follow in the problem solving process. At every stage of the instruction, the students were made to develop code pieces to solve different exemplary problems and were provided with instant feedback and corrections for their mistakes. At the end of each session, they were given problem statements as extracurricular activities, which they were asked to solve for the next session.

The exemplary problems and extracurricular activities used in both groups are the same. However, solutions were formulated as algorithms in experiment group I and as pieces of Visual Basic program in experiment group II. As a result, experiment group I used algorithms to solve a problem, while experiment group II used Visual Basic commands.

In order to identify students' opinions about the kinds of problems they experience in algorithm designing process, an interview form was developed and the students were asked to respond in writing to the questions in this form. During the process of formulating the questions, we considered that the process

of algorithm developments takes place in two stages, which are designing a solution by analysing the problem and applying the designed solution. As a matter of fact, the literature contains evidence that these stages are the basic stages in problem solving process (Schoenfeld, 1992; Harskamp, Suhre, 2007; Kızılkaya, Aşkar, 2009). In this framework, the students were asked the following questions:

1. What are the problems you experience in the process of problem analysis and solution planning when you are to write an algorithm to solve a problem?
2. What are the problems you experience when writing a solution you design in the form of an algorithm?
3. What do you think is the primary problem of first priority that you are faced with during the entire process of developing an algorithm?

The interview form used to identify the students' difficulties was analysed by the researchers using the document examination method; similar ideas were grouped to calculate their frequencies and rates. In cases where a student expressed multiple opinions, all opinions were taken into consideration. Thus, frequencies for some ideas were found to be greater than the sample size.

RESULTS

Table 1 summarises student responses to the following question: "What are the difficulties you have in the process of problem analysis and solution planning when you are asked to write an algorithm to solve a problem?"

Table 1. The Difficulties in Problem Analysis, and Solution Planning for Students

Difficulties Experienced in Problem Analysis	I. Exp. Gr		II. Exp. Gr	
	f	%	f	%
I do not have any difficulty in planning a solution for a problem. I understand a problem, and find out what operations are required.	9	40,9	6	20,7
I understand the problem but cannot design the solution.	8	36,4	10	34,5
When writing an algorithm, I cannot decide on the sequence of operations at the stage of problem analysis.	2	9,1	4	13,8
Since my knowledge of mathematics is inadequate, I have much difficulty in finding out the solution in cases where complex mathematical operations are required.	3	13,6	9	31,0
Total	**22**	100	**29**	100

As is clear from Table 1, concerning the difficulties experienced in problem analysis process, 40.9% of the students who were simply taught algorithms stated that they had no problems in the process; 36.4% experienced problems about mentally designing the solution; 13.60% had difficulties in finding out the solution in cases that require complex mathematical operations since their knowledge of mathematics is inadequate; and 9.1% stated that they had difficulties in determining the sequence of operations needed. As for the students who were directly taught a programming language, 34.5% stated that they had problems in mentally designing the solution; 31.8% had difficulties in finding out the solution in cases that require complex mathematical operations since their knowledge of mathematics is inadequate; 20.7% had no problems in the process; and 13.8% stated that they had difficulties in determining the sequence of operations needed. It could be concluded that the group who were simply taught algorithms had less difficulty in planning a solution for a problem and solving problems that require mathematical operations when compared to the group directly taught a programming language. On the other hand, a significant part of neither the students who were directly taught a programming language nor those who were simply taught algorithms had any difficulty in understanding a problem but both had difficulties about solutions.

Table 2 summarises student responses to the question "What are the problems you experience when writing a solution you mentally design in the form of an algorithm?"

Table 2. Difficulties in Expressing Solutions as Algorithms according to the Students

Difficulties Experienced in Developing Algorithms	I. Exp. Gr		II. Exp. Gr	
	f	%	f	%
I do not have much difficulty in writing a solution I mentally design as an algorithm.	2	7,1	2	7,7
I cannot express the steps I mentally design in the form of an algorithm (I do not know how and where to start).	9	32,1	13	50,0
I experience problems with cycles.	6	21,4	3	11,5
I have problems about condition statements.	6	21,4	1	3,8

I have difficulty in identifying and using variables (particularly index variables).	5	17,9	3	11,5
I can easily write codes using Visual Basic but have difficulty in converting them into algorithms.	-	-	4	15,4
Total	**28**	100	**26**	100

As seen in Table 2 concerning the difficulties experienced in the algorithm development process, 32% of the students simply taught algorithms had difficulties in expressing the steps they mentally design in the form of algorithms; 21.4% had difficulties both in cycles and condition statements; and 17.9% had troubles in the use of variables. As for the students directly taught a programming language, 50% stated that they had difficulty in expressing the steps they mentally design in the form of algorithms; 11.5% had difficulty in both cycles and the use of variables, while 15.4% stated that they did not have any difficulty in writing codes using a programming language but have trouble in expressing these solutions in the form of algorithms. Furthermore, a very small part of both student groups (7.1% of those simply taught algorithms and 7.7% of those directly taught a programming language) stated that they did not have any difficulty in developing algorithms. Thus, a majority of both student groups arguably had problems in the process of designing algorithms. On the other hand, the students simply taught algorithms had the greatest difficulty in expressing the solutions they design in the form of algorithms, in cycles, condition statements and the use of variables, while those directly taught a programming language usually had difficulty in expressing solutions as algorithms.

Table 3 summarises the student responses to the question "What do you think is the primary problem of first priority that you are faced with during the entire process of developing an algorithm?".

Table 3. Primary Problems of First Priority in the Process of Algorithm Development for the Students

Primary Difficulties of First Priority Experienced during the Entire Process of Algorithm Development	**I. Exp. Gr**		**II. Exp. Gr**	
	f	**%**	**f**	**%**
I have difficulty in determining where and how to use variables	4	18,2	1	4
I cannot be sure about how to design cycles.	4	18,2	1	4
My primary problem does exactly not know about the concept of algorithm, and where to use algorithms.	2	9,1	0	0
Failure to comprehend the logic of algorithms	3	13,6	1	4
I cannot put algorithms down on paper.	2	9,1	3	12
I have trouble in establishing links between mathematical logic and algorithmic logic.	1	4,5	3	12
Analysing and envisioning problems.	4	18,2	11	44
Lack of experience.	2	9,1	5	20
Total	**22**	100	**25**	100

As is clear from Table 3, the aspects about which the students had the greatest problems in the algorithm development process include variables, cycles, problem analysis and envisioning solutions, respectively, for the group simply taught algorithms (18.2%), and problem analysis and envisioning solutions for the group directly taught a programming language (44%). On the other hand, 20% of the students in this group attribute their problems to their lack of experience. Therefore, it could be argued that more problems are experienced in variables, cycles and problem analysis by the students simply taught algorithms, and in problem analysis and envisioning solutions by those directly taught a programming language when compared to other skills.

CONCLUSION AND DISCUSSION

According to the student opinions, the group simply taught algorithms have less difficulty in planning a problem solution and solving problems that require mathematical operations when compared to the group directly taught a programming language. Each programming language has its peculiar writing rules. On the basis of such writing rules, mathematical statements differ from standard statements used in daily life. For instance, "a=a+1" is used to increase a variable's value in Visual Basic, whereas statement a++ is used in C# for the same operation. Such statements are used in the form of standard mathematical statements while teaching algorithmic logic. Thus, a lack of understanding about the mathematical statements peculiar to programming language among the students directly taught a programming language might have resulted in greater difficulties for them in finding out solutions involving complex mathematical operations when compared to the students simply taught the algorithmic logic. The troubles experienced by mathematical statements by the students directly taught a programming language might have complicated their problem analysis process. On the other hand, a significant part of both students directly taught a programming language and those simply taught algorithmic logic did not have any difficulty in understanding the problems but had troubles about

solutions. This could be attributed to underdeveloped algorithmic thinking, critical thinking, mathematical thinking or problem-solving skills on the part of students.

The greatest difficulties are experienced in expressing a design solution in the form of algorithms and the use of cycles, condition statements and variables by the students simply taught algorithmic logic, and in expressing the solution in the form of an algorithm by the students directly taught a programming language. The students directly taught a programming language can easily see the results of cycles, and condition commands on the editor, which could have resulted in less difficulty with these subjects for them when compared to the students simply taught algorithms. In fact, some of the students directly taught a programming language stated that they were able to write code pieces using Visual Basic commands but failed to express the same code piece in the form of an algorithm. This might also have led to the greater troubles for these students in expressing the solutions they design in the form of algorithms when compared to those simply taught algorithmic logic. In fact, these students can easily follow the results of the Visual Basic codes they write using the editor, and, when necessary, use the trial-and-error method to solve the problems for which they have difficulty in designing solutions.

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STUDENTS' PERCEPTIONS OF ONLINE LEARNING AND INSTRCTIONAL TOOLS: A QUALITATIVE STUDY OF UNDERGRADUATE STUDENTS USE OF ONLINE TOOLS

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Abstract

The purpose of this study was to describe undergraduate students' experiences and perceptions of online courses based on interviews, observations, and online focus groups. I describe (a) motivational and learner characteristics within online classes, (b) the positive and negative aspects of online courses as experienced by students, (c) what instructors can do to improve the teaching of online courses, and (d) how undergraduate students' perceptions of the online learning environment and the tools used affects the selection of their approach to learning.

Data analysis from this study produced five primary findings across the four research questions. The first finding is the role of communication in shaping students' perceptions and approach to learning. The second finding is that participants did not perceive the negative attributes of technology to be inherent to the technology itself but in its use and implementations. Included in this second finding is that the tools used were not as important as the quality of communication and that the value assigned by students to any tool is influenced by the way the tool is implemented. The third is that course organization is key to student learning and success. The fourth is that student' approaches to learning appeared to be shaped by both the structure of the learning environment and the nature of assessments used in the online environment. Included in this fourth finding is students' perceptions of online learning as being less academically rigorous than their experiences in face–to–face education. The fifth is that students use nonacademic resources to locate information rather than the university library.

Presentation will consist of a summary of students' perceptions and an overview of methodology, including the movement from face-to-face focus groups to an online model and the use of think-aloud observations and interviews in collecting data on online student learning.

Introduction

The number of students taking at least one fully online class from an accredited university in the United States has grown significantly over the past decade. Between 2002 and 2007, the number of online students jumped 145%, from 1,602,970 to 3,938,111. Moreover, of the 17,975,830 students enrolled in degree–granting postsecondary institutions in the US in 2007, 21.9% were taking courses online (Allen & Seaman, 2008). This upward trend in online enrollment, which is expected to continue well into the second decade of the 21st century, clearly poses a number of challenges to the education community (Allen & Seaman, 2008). How will universities handle such a rapid increase in the number of online students? What alternative course delivery methods will best meet online students' needs? To date, much research has been focused on the former question and, in particular, on the technical aspects of online education such as access and information delivery. Research in the area of the latter subject is growing but has overlooked one critical aspect that needs to be understood if electronic learning (e–learning) is to be made more effective in the future: how do student perceptions impact their actions, approaches, and learning within the online educational environment?

Purpose

The purpose of this study was to describe undergraduate students' experiences and perceptions of online courses based on interviews, observations, and online focus groups. I describe (a) motivational and learner characteristics within online classes, (b) the positive and negative aspects of online courses as experienced by students, (c) what instructors can do to improve the teaching of online courses, and (d) how undergraduate students' perceptions of the online learning environment and the tools used affects the selection of their approach to learning.

Significance of the Problem

Research into the effectiveness of online instruction has looked primarily at individual implementations of instructional methods within a single class or set of classes taught by a single instructor (Means et al., 2009). Where this study differs is that it investigates online instruction in the typical faculty-developed course, that is, approaching online instruction from the student perspective in a mix of "typically" delivered and designed classes. These classes were not the exceptional online class designed to investigate a new or innovative online practice, they were simply what Edventures (2009) would term the current state of online instruction.

This study provides a rich, complex, and detailed picture of students within the online learning environment. By organizing the analysis of data and content around approaches to learning, learner–centered tools can be developed that promote deep learning approaches in undergraduate students during online learning experiences. Results from this study yielded recommendations for changes in the design of online and e–learning that encourage student learning that is aligned with faculty, student, and institutional perceptions of online education. Faculty may be expected to improve their online instruction through a clearer insight into the effects of course management tools.

Developing effective online learning environments is becoming a challenge for many universities. Current trends in education, which include shrinking funding, have spurred greater competitiveness among universities as they seek new ways to attract students not only in traditional environments but also in the online environment. In both, it is important to maintain academic integrity and to ensure high levels of student learning and by achieving a better understanding of students' needs in relation to their learning, online education can be improved an its value as an educational tool increased. By investigating ways that students perceive and interact with the learning environment, it may be that the design of the online learning environment can be better developed to support learning.

From a business of education standpoint, it is essential to remember that practitioners of education should not only be concerned with the number of degrees awarded but also the quality of student learning obtained in achieving those degrees. Thus, the focus of this study was on the students, who they are and how best they can be served.

Design, Collection, and Evaluative Framework

The methodology used in this study was derived primarily from research into student learning and the selection of approach, in the tradition of Marton and Sajjo (1976), Entwistle and Ramsden (1983), Biggs (1987), Prosser (1999), and Ramsden (2002). Central to this approach is the perspective of the student regarding both the process and outcomes of learning and instruction. Qualitative data-collection techniques were used to obtain and describe undergraduate student views on online instruction, online learning tools, and instructional processes. Three stages of data collection were used in this study these were (a) one-on-one open-ended interviews, (b) think-aloud observation, and (c) online focus groups. The main data collection was student interviews. Data from think-aloud observations and online focus groups were used to confirm findings from the interviews. Data were collected between the Summer and Fall academic sessions of 2008 at two sites. Additional data were collected in the Summer of 2010. This study will continue and be updated with data collection resuming in the Summer of 2011.

Setting

The sample consisted of 16 undergraduate students who had completed or were enrolled currently in an online course at one of the two universities. Students were recruited to participate in one or more of the data-collection methods; these were 11 in the interview process, 8 in the think-aloud observations, and 8 in the online focus groups: 5 in one group and 3 in the other group. Student participants were mostly in their mid–20s; 10 were female, and 6 were male. Three students participated in all three data-collection methods, five students participated in two of the data-collection methods, and eight students participated in only one data-collection method.

All students were drawn from religiously affiliated universities in Northern California. Both universities (S1 and S2) are primarily undergraduate universities, whereas university 2 (S2) has a more diverse population both in age and ethnicity. The graduate populations at both schools were not included in this study. University 1 (S1) is a medium–size, private university with a student population of approximately 8,500: about 5,000 undergraduate students and 3,500 graduate students. The undergraduate population has a male to female ratio of 45% to 55%, and about 35% of undergraduate students identify themselves as persons of color. Almost 60% of undergraduates are from California, with the others coming from throughout the United States and more than a dozen foreign countries. Between 65% and 70% of undergraduate students receive some form of financial aid: scholarships, grants, or loans. University 2 (S2) has an undergraduate population of approximately 5,500 and a graduate population of approximately 3,300. The ethnic breakdown for S2 is as follows: European American 39%, Asian American 20%, Latino or Hispanic American 15%, International 7%, African American 4%, Native Hawaiian or Pacific Islander 2%, and Native American 1%, with 11% unidentified.

Faculty participation in this study was not a requirement. Two of the faculty from S1 met with me prior to the start of data collection. The purpose of this meeting was to discuss the upcoming course offerings and the data-collection process. Currently, the majority of online course offerings at S1 are within the College of Arts and Sciences academic summer programs; the remaining offerings are in the business school and the law school. Students in S1 for this study were primarily from the College of Arts and Sciences and the School of Business undergraduate programs. Students from S2 were drawn from business and nursing.

Findings

The framework of approach to learning is used to analyze the data collected for this study. Three approaches to learning as described in the literature are called “deep,” “strategic,” and “surface.” Strategic learning is sometimes called “approaching,” depending on the researcher and the nature of the study. Deep learning is defined as examining new facts and ideas critically, tying them into existing cognitive structures, and making numerous links between ideas (Rosie, 2000). The deep learner is able to retain information and to organize materials in a variety of ways that aid in making meaningful connections that promote learning. Characteristics of deep learning include: looking for meaning, focusing on the central argument or concepts needed to solve a problem, interacting actively, distinguishing between argument and evidence, making connections between different modules, relating new and previous knowledge, and linking course content to real life. The strategic learner is a student who intends to achieve the highest grade possible through effective time management and organized study methods. Students exhibiting a strategic approach are focused on the assessment process (Entwistle & Ramsden 1983).

I examined participants’ responses in interviews, think-aloud observations, and online focus groups; categorization of responses was based on the tools mentioned, statements of value, and perceptions of positive or negative effect on learning. The think-aloud observations and online focus groups served to confirm or add insights to data collected during the interview process. Sixteen undergraduate students who had completed or were enrolled in an online course at one of two universities participated in the study. Of the 16 students, 11 participated in the interview process, 8 in the observations, and 8 in online focus groups. Three students

participated in all three data-collection methods, five students participated in two of the data-collection methods, and eight students participated in only one data-collection method.

Analysis of the data from interviews, think-aloud observations, and online focus groups produced five major findings. These five findings are (a) the role of communication in shaping perceptions and actions of students, (b) how technology is used not the technology determines its value, (c) the role of course organization for students success, (d) approaches to learning are shaped by students perceptions as are students determination of academic quality, and (e) students use nonacademic resources because of ease and familiarity.

The role of communication in online learning took many forms and was dominate in every data-collection method. Although students took online courses because they wanted independence and self-regulation, they also stated a desire for concise directions on everything from assignments and assessments to when and how to access course information. The expectations for communication went beyond just a need for direction. All of the participants expresed a view that faculty was "missing" from the educational conversation. How instructors communicate online was perceived to a limitation of online learning. When communication was perceived lacking, participants lower their approach learning electing for more strategic or surface learning.

Participants did not perceive the negative attributes of technology to be inherent in the technology so much as to its use and implementation. What participants expected was that communication technologies would be used in ways familiar to them and in providing a timely response to participants' educational needs. Indeed, poor technology implementation was mentioned in association with the lack of organizational structure found in some online instruction. In interviews, think-aloud observations, and online focus groups, participants expressed the perception that faculty lacking in technology skills were likely to use or implement technology in a way that resulted in confusion.

All 16 participants stated that the main reasons for pursuing online instruction were flexibility and self–control within the learning environment. Participants perceived online learning to be a convenient alternative to traditional classroom learning but indicated that convenience came with a price: in gaining independence, self–directed learning, they were losing direction from and communication with instructors. In some instances, this tradeoff was perceived to decrease the educational and academic value of the learning experience. For these participants, academic value was perceived to come from interaction and engagement from peers and faculty. Participants indicated that without necessary direction from faculty online learning allows for an approach to learning that is more surface– or strategic–oriented than is the case in the traditional face–to–face classroom experience.

The resources provided by universities for students research and information gathering were perceived to of less value then nonacademic tools. The use of nonacademic database sources was especially true when participants were asked to use online databases to perform research. During the think-aloud observations, participants used Google® and Wikipedia® before those resources provided by the university. When asked to explain their use, participants stated that Google® and other free tools are familiar and do not have the access restriction placed on them that university systems have. Additionally, participants stated that the university tools were cumbersome and hard to navigate.

In summary, tools used for communicating or conducting research were not as important as the communication itself. Perceptions of value for any tools used depended not on the tool but on the speed and consistency of communications. Participants did not perceive the negative or positive attributes of tools or technology to be inherent to the technology itself, but to its use and implementations. When faculty were perceived to be unresponsive, it was not the tool that was perceived to be of little educational use but the level of communication. When faculty were perceived missing from the educational conversation the academic quality was perceived diminished compared with face-to-face instruction. When the academic quality was perceived low, participants exhibited a strategic or surface approach to the learning.

Recommendations for Future Research

Although this study confirmed past research results (Cotton, 2006), it is believed that a more thorough study will provide additional data on students' perceptions and use of the online environment in the promotion of learning. Although the study was limited to two religiously affiliated institutions with limited online programs, a larger study would offer results that could be applied more generally. This study was conducted in primarily short 5-week summer online courses with limited enrollments. The exceptions to the summer courses were two short 5-week courses at University 2 (S2) in the Fall of 2009 and the OMIS course taught by me during the regular 10 week sessions at University 1 (S1). It is possible that selection of a small range of online courses produced a limited range of course interactions. Because of this limitation, a larger study conducted in a wider range of disciplines may produce a different set of results. One such study, just completed and published, showed similar findings, yet was able to look more closely at students' approach to learning through a wider set of interviews and other data-collection methods (Ellis & Goodyear, 2010). Ellis and Goodyear were able to draw a relationship between online discussion and student approach to learning. In particular, Ellis and Goodyear found statistically significant relationships between deep approaches, cohesive conceptions, positive perceptions of the learning context, and higher levels of student performance. Although the collection of student performance data can be problematic, more studies investigating students measured use of approach in relation to student outcomes in online learning could prove useful.

Perceptions of communication played an important role in the results of this study. Although this study relied on students' perceptions of communication and observations of their actions within the online environment, actual communications were not assessed. Future studies that look at possible links between faculty use of communications, the content and amount and communications online, and the perceptions of students may be warranted.

This study and others have investigated only a few of the possible relationships between perception of the online environment, the tools used, students' approach to learning, and students' perceptions of learning. A more focused investigation of student perceptions of the design of online learning, including Internet resources, the role of community, and social networking is needed. Although Internet resources and community and social networking were mentioned in this study, they may play a larger role in student communication and learning than was described in this study.

An additional phenomenon not investigated fully by this study is the link between perception and outcome. Assuming a link between perception and outcome based on past research may not be sufficient when considering the online environment. An investigation of the relationships between online perceptions, approach, and outcomes is an area that may merit further research.

Comparing students' expectations and actual use of communication technology with the use and expectation in the online classroom could inform future studies on student perceptions of online learning. Faculty use and knowledge also may effect student perceptions. Additional factors not investigated in this study include (a) institutional beliefs around online learning, (b) the place of online learning in the strategic plan of the university, and (c) the implementations of teaching standards related to online instruction.

Studies investigating faculty perceptions and training are numerous; however, the link between faculty training in the use of standards for the development of online courses and student perception and outcomes is not well understood. What participants say they want in an online course and the standards as written into resources such as the Rubric for Online Instruction (ROI) are similar. These similarities include more communication, faster response time, and more engagement with peers and faculty. The standards used in the ROI, and other such tools, are widely used teaching the development and assessment of online education across the United States and other countries, but studies linking the standards contained in the ROI to student perception are limited, as are studies linking the use of the ROI to either student approach or increased student outcomes. An investigation of the effects of the ROI on perception, approach, and outcome may provide educators a better understanding of how best to design online education in the future. One possible outcome of such research may be that including basic teaching strategies not specific to the online

environment are not necessary in tools like the ROI and that including such information diminishes there value to faculty.

Although not specifically a limitation, one area of concern within this study is that participants' statements of response time was not followed up on during data collection. All participants stated that faculty and students were unresponsive at some time yet a precise time was never ascertained. Investigating what is an appropriate response time for e-mail, discussions, and assignments may be an area of further research.

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STUDY ABOUT PREREQUISITE TECHNOLOGY FOR MOBILE COLLABORATIVE E-LEARNING IN CASE OF KOREA

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Abstract

Many e-learning service providers are preparing the ubiquitous ages which provide next generation IT environment and have prior occupation of mobile collaborative learning system in a world e-learning market. Based upon excellent experience of the mobile communication technology and collaborative learning LMS developments and instructional design model, mobile collaborative e-learning require many kind of IT and pedagogical technologies. This study suggests prerequisite and minimum m-learning technologies in order to provide mobile educational service of collaborative learning concept to the learners.

1. Introduction

Although related to e-learning and distance education, M-learning is distinct in its focus on learning across contexts and learning with mobile devices. Learning that happens across locations, or that takes advantage of learning opportunities offered by portable technologies. The scope of m-learning includes students using handheld computers, PDAs or mobile devices. M-learning has some tremendous advantage as follows:

- Accessible and easy-to-use
- Wide-range of target markets
- Real-time communication and entertainment (games)
- Rich media source (video clips, pictures, internet)
- Enables learning / practice on-the-go

The e-learning industry is rapidly growing, thanks to the financial support from employment insurance plan. We can see that m-learning industry is in its early stage of introduction to Korean market as well as world market.

Based on the progress of mobile technologies such as mobility, constant availability, individualization, and user-friendly adaptive interface, the future of m-learning is predicted that it looks very potential in terms of prospective market growth.

2. Changes of platform in e-learning

2.1 Changes of e-learning environment

The next generation web is a platform, which enables everyone to use data without owning it in any programming product or any Internet environment. It means that the interaction between a professor and a

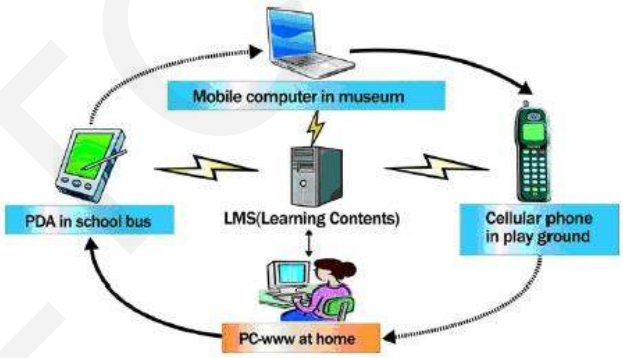
learner becomes active. The following table is a simple abstract demonstrating the changing of the concept of e-learning consortium, which results from the appearance of the next generation web environment.

[Table 1] Change of e-learning environment

existing e-Learning	e-Learning 2.0
Learning organization	Personalization
Centralization (Top down)	Localization (Bottom up)
Push	Pull
Delivery	Oriented learning
SME	Teacher<->Learner, Learner<->Community
Course, Program	Gathering
Intellectual property	Studying element, Connection
The degree of freedom which is limited	Social property, Sharing
Special application	The degree of freedom which is magnified, Open
High investment / Administrative cost	Low investment / Administrative cost

The source: e-learning consortium, Japan, 2007, The sprout base reconstitution

A teacher and a learner will have a collaborative interaction in the next generation. The maintenance of collaborative interaction is one of important environment changes besieged e-learning. Real-time interaction can be enabled with developing telecommunication technology. The following picture shows a real-time collaborative education model according to combination with mobile technology.

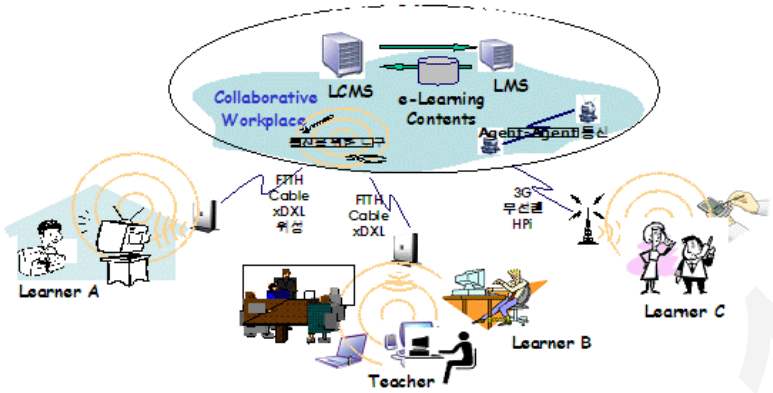


[Figure 1] Environments of mobile e-learning

2.2 Changes into multi-platform

The e-learning is a learning type which supports accessible information seen without limitation of space and time through internet at anytime, anywhere due to advance of information and communications technology. The education content is also advancing from unilateral contents delivery to contents customized by individual needs, and from teacher directed to learner directed personal. The existing e-learning which substitutes online education for traditional education is just passive education/training and its education effectiveness lacks. In order to overcome this, the research about the application various types of contents to multiplatform is under way. Recently various platforms appear and use the same content in various platforms. It demands conversion solution to support various platforms (interactive TV,

PDA, between web contents and the mobile contents).



[Figure 2] Multi-platform Based Collaborative e-Learning Environment

2.3 Environment for mobile and ubiquitous e-learning

In case of mobile media like the cellular phone or PDA which we use frequently, it is possible to search and share information anytime, anywhere without restrictions of time and space. Currently mobile is paid attention as the new education medium due to mobility, accessibility and expandability etc. In other words, mobile can provide opportunity of self directed learning if a learner wants it without restriction of time and space. The hegemony of information and communications technology media has already been moving from the computer into the mobile media. This information gives us serious means when we consider the potential of a cellular phone to be used as an education tool. There are already foundations of mobile education.

Hereafter life-long education will lead through ubiquitous of learning, class and learning space, which can cover digital cyber life space. It is expected that school will be advanced to a local social learning center, one of the learning structural part, network oriented schooling. It is expected that the environment, which is able to support active learning method by using the various IT such as digital TV, magic mirror[1] etc. will be soon developed.

It is possible to develop a creative education course which is learner oriented, through building an education environment which can be used on various terminals anytime, anywhere, and supporting all contents. This educational environment is possible to support education by level since the intelligent program checks open learning performance and responses to the learner. The educational environment delivering knowledge by teacher unilaterally will be changed, and the opportunity and competency of inter communication will be improved.

2.4 Survey of future e-learning technology

The e-learning collaborative learning is distant learning by using the internet. This is instruction-learning environment which provides various learning activities through interaction among learner,

[1] Magic mirror provides various customized information such as learning message, lesson time table, weather forecast, etc. It is possible to explore museum exhibition information and to store still or moving picture with POI(Point of Information) through the carrying electronic digital book.

operator, and contents of learning, based on telecommunication network, where the media is a computer.

The necessity for great human development according to the need of social adult education through aggravating of global competition in every field of social is rising. The adult education change which responses the necessity is leaded mainly by the university education market. On the other hand, it is also coming to be highlighted that there is a social demand for specialty vocational education and life-long education target by common people and not necessarily by the students.

Consequently e-learning is receiving footlights as it supports the means to improve the quality of education and the variety of education, and supports the self-directed learning. A lot of universities accept the course of practical contents from industry fields, because it is too much practical to learn in university. Through such activities, the universities are improving quality of leaning contents.

All over the globe and particularly within advanced countries, leisure culture importance is inclining constantly. Nowadays people value more their free time not only as time to rest and spend with their family, but also as time to broaden their education and knowledge, time to invest and develop their intellectual resources.

KATS(Korea Agency of Technology and Standard) that is one of the Korean Government surveyed about future technology for e-learning in 2009. It was performed using Delphi survey by 48 experts through the e-learning technology domains as [Table 2].

[Table 2] Technology domain for survey

Domain	Number of elements
Instructional design	12
Learning strategy	14
Learning resource	11
Contents development	17
Learning tools	17
Learning environment	11
Assessment and evaluation	11
Participants information	8
Security management	8

Source: Technology roadmap for e-learning for the future, 2009, KATS

The best way to achieve the knowledge in accordance with the situation is through e-learning, an educational system that enables the student to learn in his own terms and within his natural environment, thus he is not forced to leave his home, family, and leisure activities, this way of learning enables him to combine the studies with other activities he might do.

Korea, in common with the US and Europe, is adopting the same leisure culture pattern, if academicals and professional courses were considered as labor time activities in the past, today the number of Korean that choose to enrich their educational and professional knowledge during their leisure time is increasing.

For example, Korean demand for language studies has reached sky-high limits. Many people feel that they miss something, living a lifetime with the idea of only knowing one or two languages.

3. Prerequisite collaborative mobile e-learning technologies

3.1 Mobile and ubiquitous technology

The international e-learning technical standards have an intention of developing the solution which is related with collaborative learning and a contents development and a service. Collaborative mobile e-learning requires the technologies of computer engineering, instructional design, database and contents development etc. not only international technical standard but also technical development of LMS, LCMS or database for collaborative learning where become the technique which leads to future e-learning. Result of survey about mobile e-learning technologies shows in [Table 3] among 9 e-learning technology domains.

This table shows that "collaborative learning based instructional design", "various activities oriented instructional design", "Quality innovation" and "self directed learning based instructional design" are very important prerequisite technologies of instructional design domain for mobile e-learning in the future.

[Table 3] Result of instructional design domain

Technology	Importance		
	Mean	Standard Deviation	Rank
Ubiquitous based instructional design	3.9	1.23	6
Rapid instructional design	3.3	2.64	12
Quality innovation	4.2	1.25	3
User customized instructional design	4.0	1.11	5
Learner participated instructional design	3.6	1.83	9
Intelligent LMS based instructional design	3.6	1.86	9
Self directed learning based instructional design	4.2	1.28	3
Various activities oriented instructional design	4.3	1.29	2
Collaborative learning based instructional design	4.4	1.45	1
Automated instructional design	3.6	1.96	9
Combination of individual and group learning	3.8	1.45	7
Collective intelligence based instructional design	3.8	1.45	7

Source: Technology roadmap for e-learning in the future, 2009, KATS

Korea has the research which is renovation about the solution of ubiquitous e-learning techniques and possesses the technique of collaborative learning which is able to be used by business environment. Also, Korea has advanced the infrastructure which is able to accept new technology and to execute new learning technology. In addition, with about the timely LMS development whose meantime, Korea owns much experience to develop LMS, already learning model and technique and accomplished a research

work about various educational contents.

3.2 Learning environment technologies

In order to fill the gap between customer demand and current technical capabilities (sometimes referred to as the "technology chasm" or the "WAP Gap"), service providers rely on existing mobile messaging and data services capabilities that do not support m-commerce and/or require expensive closed proprietary networks and devices. As a result, today's solutions fall far short of end user expectations. Therefore, for technology delivers today, many of the promises of tomorrow's "Always Connected" environment by supporting existing devices and infrastructure to place customer one click away from completing transactions anytime, anywhere. At the same time the technology provides capabilities that are not supported by any other wireless data technology today. Result of survey about instructional design of e-learning technologies shows in [Table 4] among 9 e-learning technology domains.

This table shows that "mobile environment", "wireless network environment", "ubiquitous and blended environment", "blended and mobile" and "sensor network environment" are important prerequisite technologies for e-learning in the future.

[Table 4] Result of learning environment domain

Technology	Importance		
	Mean	SD	Rank
Mobile environment	4.2	1.37	1
Ubiquitous and blended environment	4.1	1.11	4
Contents reuse like video e-clip environment	3.8	1.79	9
Personalized learning environment	4.0	1.16	5
Smart learning environment	3.8	1.85	9
Self direct learning environment	4.1	1.07	3
Wireless network environment	4.2	1.37	1
Blended and mobile	4.0	1.05	5
Sensor network environment	4.0	1.12	5
Virtual reality environment	3.7	2.25	11
Future web 3.0 environment	3.9	1.69	8

Source: Technology roadmap for e-learning in the future, 2009, KATS

The combination of signaling technology with one-click instant fulfillment makes up signal click, a technology providing a complete end-to-end solution for alert based services. The technology enables mobile device users to stay in touch with time-sensitive events and be taken directly to related information and transactions with one simple click of a button. It alerts cause the user to connect directly to web pages that have all the information necessary to complete transactions with the single click of a button. A feature of the technology does not require any software presence in the mobile handset. It adds

the capabilities of launching, installing, and configuring an application upon reception of an alert.

The following issues technically strengthen to provide m-learning radiantly for learners, tutors and lecturers.

4. Conclusion

4.1 Summary of mobile e-learning technology in the future

From larger e-learning markets, currently, LMS support in the market which becomes the mobile educational platform is insufficient, on the other hand, LMS which will be developed is very efficient in enterprise style e-learning where the educational service structure which is discrimination, is necessary. The successful possibility of mobile service for on-line education is very high because on-line educational field is a target for users who have high loyalty.

On the other hand, interest age class of PDA and cell phone is different from each other, as the form of the terminal changes to the smart phone which is combined PDA and cell phone. The approach in mobile education is coming to be easy gradually.

Collaborative learning is composed of the learning own small-scale group and mutual cooperation process leads to specific subject. The research is plentifully advanced with the learning method to be solved together. But in the solution of actuality it is a situation which is wholly lacking from the application characteristic side. To provide mobile educational service of collaborative learning concept to the user, it requires prerequisite integrated m-learning technologies

4.2 Future work

In order to operate various broadcasting and communication infrastructure, we need a full m-learning services accomplishment, which develops interoperability program, a multiplatform environmental support core technique in learning services and an effective collaborative learning technology based upon the ability to interact among the group, participants and agents.

[Table 5] Future work

Objectives	Items
API technology which supports interoperability in multiplatform	- Design metadata for message communication between multiplatform environments - Development of contents model engine which support to multiplatform - Development of adaptive learning contents API - Development of learner profile management technology
API technology for collaborative m-learning in multiplatform	- Design of workplace reference model - Development of agent-to-agent communication technology - Development of interaction technology for participant-to-participant

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STUDYING THE PERCEPTIONS OF PROFESSORS OF ISLAMIC AZAD UNIVERSITY ABOUT OBSTACLES OF USING EDUCATIONAL TECHNOLOGY IN TEACHING_LEARNING PROCESS .

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ABSTRACT

The main purpose of this research was to study the the perceptions of the professors of Islamic Azad university about Obstacles of using Educational Technology. The statistical population was full_time professors with 2 years record of teaching service at Azad University branches in 2009_2010.By using cluster sampling and according to Krejcie- Morgan table 250professors selected as sample. Data collected using a researcher-made questionnaire in Likret scale. Data analyzed by using chi-square test. results indicated that the disproportion of materials volume to its appropriated time, inaccessibility of teachers to media and auxiliary equipments, students 'impatience, the lack of equipments, unavailability of educational technology publications and the inability of teachers in preparing didactic materials and curriculum were most preventing factors in using educational technology in branches of Islamic azad university.

INTRODUCTION

One of the most important indicators in developing countries ,is the quantity and quality of outputs of the educational system . Qualitative and quantitative indicators has a close relationship with Teaching - learning process. Teaching - learning process, is a set of activities that professors and students do in an educational position, to do the desired changes in learners behavior . Through educational technology which can help improve information and process of teaching and learning ,plays an important in this area. Majdfar(2006) mentioned that it is necessary to identify the capabilities ,facilities and obstacles of educational technology in educational systems in order to achieve the educational objectives of educational systems.

Oulomer(2005) said that the concept of educational technology is "Process and the systematic collection of information and communication capabilities that provide complete teaching performance". Abaszadeh (2006) believes that many teachers have little knowledge about educational goals. Therefore necessary efforts to achieve educational goals is not done. More than half of the teachers are not familiar with the methods and new techniques of teaching and learning for designing curriculum and training students in classroom, so they use traditional methods. Among the most important barriers of using educational technology in the classroom, the numbers of students in each class (student density) and lack of compatibility between volumes of students book and the time for teaching , are most important. Nafisi(2004) in a research concluded that the educators can use various instruments such as computers, local network and internet learn to improve teaching-learning process, and it requires they play as an facilitator of teaching-learning process.Nowruzi et al(2006),mentioned that the appropriate technology in general education process is using multimedia software and simulators, but the best methods of using technology in learning for high schools and vocationary students is using internet-based methods.

Yaghma(2009) believes the fundamentals of educational technology, are based on behavior psychology theory. In educational technology, strengthening and deepening of previous learning, self assessment and feedback found, retrieve the needed information, laboratory and workshop activities in virtual environments, creativity, knowledge production and presentation, using electronic tools and communication Academic centers inside and outside the country is considered. Herou et al (2008) stated that developing a comprehensive e-learning model by using Hypercube model is possible based on studying basic technological features of their components (infrastructure, technology and content) with the current situation of e-learning and institutions teaching skills based on a vision for implement and effective and innovative and management of e-learning.

Marinsko(2008) said that, learning to use computers in educational and teaching-learning context , gradually would be an alternative for classical perspective with the aim of providing individual education rather than group education. Therefore internet solutions and equipment offers many basic features that are replacement of traditional educational system. George(2009) emphasized the use of six efficient words: what, who, why, where, when and who in the initial implementation of education and believes that electronic payments provide electronic teaching to provide opportunities for students in exploring the potential of technology to enhance teaching and learning. Daniel et al(2010) expressed the attitude towards perception, computer knowledge, motivation, learning style, availability of infrastructure, and gender distribution of relatively large extent on the implementation and success of virtual learning is useful and appropriate use of virtual learning environments to learn self-regulation is achieved. There was a significant relationship between student motivation and effort was seen in this environment and ultimately good use of learning resources asa part of competence .

Baras and Avon (2000) mentioned that the increasing growth of science and modern technology, new methods of learning and teaching requires the use of new theories but not the theory of assuming teacher as the only wise man of stage . Learners should be play a more active role in teaching and learning and the teacher must guide the next stages and plays the role of , facilitators, and instructional designers .

RESEARCH OBJECTIVES

The objectives of this research was:

1- identifying and prioritizing barriers and problems in using educational technology.

2 - provide practical strategies to offer Islamic Azad University and other of higher education institutions involved, to eliminate barriers and problems in order to make better context for utilization of educational technology.

RESEARCH QUESTIONS

1 - How curriculum planning in Islamic Azad University ,prevents the use of educational technology in the teaching - learning process ?
2 - To what extent , the shortage of resources, prevent using educational technology in the teaching - learning process ?
3 – To what extent the negative attitudes of professors about using educational technology prevents using educational technology in teaching-learning process?
4 – According to the perceptions of professors, how can a weak performance evaluation system , prevented using educational technology in teaching –learning process?

RESEARCH METHODOLOGY

According to the research objectives and hypotheses the research method is descriptive .

*Statistical population :*The population of this research was all professors in academic year of 2009-2010 in zone 1 of Islamic azad university which were 1633 persons and a 320 person sample of them were selected by cluster sampling method to study their perceptions in this research. As male and female faculty ratio in the statistical community was nearly homogeneous, so the gender factor sampling were ignored.

Research instrument : A researcher-made questionnaire, in five degree Likert scale used to conduct this research. According to the homogeneous variances of internal consistency Spearman Brown prophecy formula for the reliability of the questionnaire which was .79. The validity of questionnaire approved by the opinions of specialists and professors of universities.

Data analysis methods: According to data collected ,Chi square test used to analyze the perception of professors in this research

RESULTS

The first research question: How curriculum planning in Islamic Azad University ,prevents the use of educational technology in the teaching – learning process ?

Table 1.

Question	No.	Frequency						Mean
		Very high	high	average	low	Very low	total	
1	1	110	65	30	20	25	250	3.86
	6	60	70	70	40	10	250	3.52
	8	100	60	40	25	25	250	3.74
	9	80	80	30	50	10	250	3.68
	17	40	75	60	45	30	250	3.20
	20	20	100	80	50	0	250	3.36
	22	80	60	75	35	0	250	3.74
Total		490	510	385	265	100	1750	3.58

df = 4 X^2 e=13.28 X^2o=331.85

As showed in table 1 since the value of observed chi-square (331.85) with confidence level of .01 and degree of freedom 4 was more than chi-square in statistical table (13.28) , so we can say that the difference between the observed frequencies are significant . Obtained mean (3.58) also shows that "weakness in the curricula of academic courses, plays a preventive role in the utilization of educational technology in teaching-learning process to great extent.

The second research question: - To what extent , the shortage of resources, prevent using educational technology in the teaching - learning process ?

Table 2

Question	No.	Frequency						Mean
		Very high	high	average	low	Very low	total	
2	4	65	55	45	50	35	250	3.26
	7	70	85	40	30	25	250	3.56
	10	75	60	60	35	20	250	3.54
	16	70	95	60	10	15	250	3.78
	11	50	70	65	55	10	250	3.36
	24	55	70	60	40	25	250	3.36
Total		385	435	330	220	130	1500	3.48

df=4 X^2 e=13.28 X^2o=205.41

As showed in table 2 since the value of observed chi-square (205.42) with confidence level of .01 and degree of freedom 4 was more than chi-square in statistical table (13.28) , so we can say that the difference between the observed frequencies are significant . Obtained mean (3.48) also shows that the shortage of resources play an important role in preventing using educational technology in the teaching - learning process to a great extent.

Third Research Question: To what extent the negative attitudes of professors about using educational technology prevents using educational technology in the process of teaching-learning?

Table 3.

Question	No.	Frequency						Mean
		Very high	high	average	low	Very low	total	
3	2	90	95	40	15	10	250	3.96
	3	55	90	40	40	25	250	3.44
	5	90	45	65	35	15	250	3.64
	13	40	105	70	25	10	250	3.56
	15	10	40	120	60	20	250	3.84

	21	55	60	55	20	20	250	3.60
	22	80	100	75	35	0	250	3.74
Total		420	535	465	230	100	1750	3.68

df=4 X² e=13.28 X²o=369.27

As showed in table 3 since the value of observed chi-square (369.27)with confidence level of .01 and degree of freedom 4 was more than chi-square in statistical table (13.28) , so we can say that the difference between the observed frequencies are significant . Obtained mean (3.68) also shows that the negative attitudes of professors about using educational technology prevents using educational technology in the process of teaching-learning to a great extent.

Fourth research question: According to the perceptions of professors, how can a weak performance evaluation system , prevented using educational technology in teaching –learning process?

Table 4.

Question	**No.**	**Frequency**						**Mean**
		Very high	high	average	low	Very low	total	
4	12	30	90	70	40	20	250	3.28
	14	60	90	70	15	25	250	3.66
	18	20	90	65	50	25	250	3.12
	19	40	45	120	25	15	250	3.32
Total		155	315	325	130	85	1000	3.34

df=4 X² e=13.28 X²o=256.95

As showed in table 4 since the value of observed chi-square (256.95)with confidence level of .01 and degree of freedom 4 was more than chi-square in statistical table (13.28) , so we can say that the difference between the observed frequencies are significant . Obtained mean (3.34) also shows that according to the perceptions of professors, a weak performance evaluation system , prevente using educational technology in teaching – learning process to a great extent.

CONCLUSION

1 - Results of the first question indicated that weakness in curriculum planning in branches of Islamic Azad university , is an important factor that greatly hinder utilization of educational technology in the teaching process - are learning.

2 - Results of the second question suggests that lack of facilities and resources in the academic units of study population and largely prevented too much advantage of educational technology in the teaching process - learning is.

3 - Results obtained from third question suggests that academics need to know the impact and importance in taking advantage of educational technology are not so much of this factor in the deterrent role of their shows. In other words, the negative attitude of professors in branches of Islamic Azad university can be considered one of the barriers of effective using of educational technology .

4 - Results obtained from the fourth question shows that in teachers performance evaluation the factor of using educational technology were not considered and this may cause as an important barrier in using educational technology in branches of Islamic Azad university

RECOMMENDATIONS

1 - In order to motivate more professors to read educational publications and training human resources ,it recommended that main organization of university make content of educational journals, needed for professors ,available and take an exam from them.

2—Branches of Islamic Azad university hold workshops to improve teaching skills of their professors. These workshops can increase the ability of professors to make simple and relatively complex materials and increase their awareness of the day enjoying the facilities are improving. Obviously enrich workshops in areas that now runs more attention should be placed in this regard, university professors qualified to be used. 3 –it is needed to review current curricula I branches of Islamic azad university and give chances to professors to participate in curriculum designing and setting objectives of each course and this may cause applying more educational technology in their teaching .

4 –if it is possible, we can establish a central educational technology center in every regionThese centers can also provide production of equipment and training required of universities and publishing useful journal and resources for short-term training and education for professors.

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STUDYING THE RELATIONSHIP BETWEEN ADDICTION TO COMPUTER GAMES AND COMMUNICATION SKILLS IN SECONDARY SCHOOLS IN SHIRAZ

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Abstract:

The purpose of this research was studying the relationship between addiction to computer games and communication skills in students of secondary schools in Shiraz .The research method is descriptive and using correlation coefficient. two researcher made questionnaire were used to conduct this study, a questionnaire for assessment of addiction to computer games (chronbach alpha=0.85) and a questionnaire for assessment of communication skills(chronbach alpha=0.83). the population was 76900 students of secondary schools in shiraz city in educational year 2009 -2010 and the sample selected by stratified random sampling and was 296 students. Pearson correlation coefficient , T test for independent groups and one way Anova used to analyze datum and results showed that: there was a significant relationship between communication skills and non-addiction to computer games in students, and addiction to computer games in boys were more than girls. And the level of parents studies had no effects on students addiction to computer games.

INTRODUCTION

Nowadays New medias and entertainment instruments due to their great attraction for many people ,do an important role in peoples life. Also they had important influences on communication , entertainments and many other aspects of our life ,they have raised some public concerns. Computer games are also follows this rule. Kalleja(2007) believes that due to interactive nature of computer games ,people pay many attention to these games. Durkin and Barber (2002) mentioned that the factor of interaction , makes video and computer games different from other media . Shaverdi (2009) mentioned that ,computer games as a social phenomenon, alongside other audio and visual media due to the rapid growth of communication technology, in recent years and also because of their attraction for children ,select most of their audience among children and adolescents .students pay a considerable part of their leisure time to do computer games and also it seems that they spend more time to computer games than doing their homework.

Communication skills in everyday life has the highest relationship with interpersonal behavior. They are a kind of human life skills that are applicable to the collective practices that helps the human emotions and their needs and communicate the personal and social goals should be available. In other words, communication skills, are learned behaviors that are documented on the interpersonal relationships with peers and other adults affect.

Harigie & Dickson (2004) mentioned that communication skills are those skills that people can be involved in interpersonal interactions. in other words those are process that through them people transfer and share their thoughts, information and feelings by verbal and non-verbal messages, to others .The sub-skills including skills related to understanding verbal and non verbal messages , regulating emotions, listening, communication and insight to the process in which assertive communication skills form the basis of skill in establishing appropriate relationships with others on the capabilities and adds to our confidence, talent and achievements that shows respect and appreciation will attract others.

Cole (2007)said that having skill to make good relation with others can give us self confidence , improve our talents and capabilities and cause people to respect us.

Doran et al(2002) in their research as the relationship between computer games and adolescent social skills, showed that the experience of playing computer games has reverse relationship with social skills and the more experienced computer games player, has less social skills.

Ramazankhany et al (2007) in a research with the name of "studying the relation between using computer and students feeling about school and their homeworkss " concluded that the use of computers in the form of addiction to games, Internet and other, on some students can cause serious mental problems and brings to the school and boys were more addicted to computer games and also these boys had bad feeling about their schools and homeworkss.

Young (1996) who found that excessive Internet users are, alone, tired, depressed, introverted, and have no self esteem.

Colwel and Pyner(2000) in their study on students in London to study computer games and its relationship with social isolation, self-esteem and aggression among students. and found that, although there was no direct relationship between playing computer games and social isolation ,but there was a direct relationship between w aggression and computer games in students.

Abdul Khaliqi et al (2005)), studied the relationship between video - Computer games and aggression in students in Tehran , and concluded that continuous exposure to computer games, especially games with violence, increase aggression in students and reduce academic performance of them.

So , reviewing the literature showed that computer games have many side effects on students behaviors. and with these considerations, the purpose of this study was to investigate the relationship between addiction to computer games and communication skills in students of secondary school in Shiraz .

Research questions were as follows:

1 – Is there any relationship between addiction to computer games and communication skills of students?

2 – Is there any difference between boys and girls in addiction or non-addiction to computer games?

3 - Does the educational level of parents (based on their degree) impact on students addiction to computer games ?

METHODS

This study was a descriptive research and datum were gathered by 2 researcher made questionnaire :

1 – A questionnaire for assessing the addiction to computer games with 18 items in likert scale for diagnosing addiction to computer games in students. Its reliability proved by chronbach alpha which was 0.85 The minimum score was 1 and the maximum were 5 in this scale and students with mean score of 2.5 and higher would be considered as addicted to computer games.

2 – A questionnaire for assessing communication skills with 20 items in a Likert scale . chronbach alpha was 0.83 .

Statistical population were 76,900 student from secondary schools in Shiraz in academic year 2009-2010 .and the sample were 296 students which selected by stratified random sampling.

Pearson correlation test, t test for independent groups, and one-way analysis of variance (ANOVA) were used to analyze datum.

RESULTS

In this study along with the main questions, some descriptive information ,that seemed to be useful also were determined.

Table 1: frequency and percentage of computer owners in the computer games device at home

	Frequency	percentage
Have computer game device	253	85.5
Have not computer game device	43	14.5
Total	296	100

As in Table (1) is observed, most students (85.5 percent), have computer game devices at home.

In table 2 , hours that student playing computer games were shown.

Table 2: frequency and percentage of hours playing computer games

	Frequency	percentage
No playing	38	12.83
1-2 hours	158	53.38
3-4 hours	54	18.24
>4 hours	46	15.55
Total	296	100

According to Table (2), only 12.83 percent of students do not play computer games during a day and more than 87 percent of students play computer games at home at least more than 1 hour.

Favorite type of computer games among the sample group can be observed in table 3.

Table3: frequency and percentage of favorite computer games

	Frequency	percentage
Action- combat	136	45.6
Creative-thinking	88	29.9
Non-sport competitive	27	9.2
Sport competitive	45	15.3
Total	296	100

As it is shown in table 3 more than 45 percent of students were interested in action-combat games.

The first research question : Is there any relationship between addiction to computer games and communication skills of students?

Pearson correlation test used to study the relationship between addiction to computer games and communication skills of students. Results showed in table 4

Table 4: pearson correlation between addiction to computer games and communication skills of students

N	r(pearson correlation)	sig
36	0.070	0.686

Because of its significance level which is more than .05 therefore there is no significant relationship between addiction to computer games and communication skills of students.

Pearson correlation test used to study the relationship between non- addiction to computer games and communication skills of students. Results showed in table 5

Table5: pearson correlation between non- addiction to computer games and communication skills of students

N	r(pearson correlation)	sig
260	0.568	0.009

Because of its significance level which is 0.009 and it is less than .05 therefore there is a significant relationship between non- addiction to computer games and communication skills of students.

The second research question: Is there any difference between boys and girls in addiction or non-addiction to computer games?

Frequency and mean score of boys and girls are shown in table 6:

Table6: Frequency and mean score of boys and girls

	Gender	Frequency	Mean
Addicted students	boy	24	4.22
	girl	12	3.70
Non-Addicted students	boy	124	1.89
	girl	136	1.75

Results showed that the frequency and mean scores of boys were more than girls. T test for independent groups was used to analyze datum for this question and the result showed in table 7.

Table7: t- test for studying boys and girls

	df	t	sig
Addicted students	34	3.986	.039

Non-Addicted students	258	1.716	.087

According to the results in table 7 there is no significant impact of gender in non- addicted students ,but there is a significant impact of gender in addicted students. This means that boys had more addiction to computer games than girls.

The third research question : Does the educational level of parents (based on their degrees) impact on students addiction to computer games ?

Frequencies and percentage of addicted students parents educational level ,based on their degrees showed in table 8:

Table8: Frequencies and percentage of addicted students parents educational level

level	frequency	percentage
Under-diploma	4	5.56
diploma	22	30.55
Upper-diploma	16	22.22
Bachelor degree	18	25
Upper than Bachelor	12	16.67
total	72	100

One way ANOVA test use for studying the impact of educational levels of addicted students parents on their addiction to computer games .the result showed in table 9

Table9: One way Anova for impact of educational level of parents on students addiction to computer games

	SS	Df	MS	F	sig
Between groups	2.754	4	.688	.894	.492
Within group	51.59	67	.770		
total	54.342	71			

According to significant level of ANOVA ,the educational levels of addicted students parents ,had no significant impact on students addiction to computer games.

CONCLUSION

Regarding the first question ,research shows that skills there is no significant relationship between addiction to computer games and communication ($p<.686$) This means that students who are addicted to computer games have no good communication skills or in other words computer games cannot improve communication skills in students. But there is a significant relationship between non-addiction to computer games and communication skills ($p<.009$) this means that students who do less computer games, have better communication skills are It could be said that this is because they play other sports or activities are using and these could improve their communication skills .

Regarding to second question ,results showed that the difference between boys and girls mean for addiction to computer games ,is significant ($p<.039$) that means the addiction of boys to computer games are more than girls.That would be due to less interest of girls in playing compute games.

Regarding the third research question, results showed that educational levels of parents does not affect students addiction to computer games. This may be a cause of availability of computers in almost all homes because of the need of doing parents job , as we can see 85 percent of students have access to computer games which is related to having access to computer devices.

RECOMMENDATIONS

Based on the results of research, it is recommended that :

- as the results show that there is a significant relationship between non-addiction to computer games and communication skills , we pursuit students to do physical activities and sports which can develop their communication skills .

- Since most computer games is done by students at home, to reduce the bad effects of these games, we should focus on teaching and doing tea sports and activities in schools.

-As most students play action-combat games which had bad effects on student behavior ,It is recommended that we help students to select creative- thinking games rather than action-combat games to develop their intellectual skills which are a base of improving communication skills.

- Holding some classes for parents to give them information about the result of researches and help them to select good games and activities for their children.

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TEACHERS' KNOWLEDGE OF CORRECTING FREE WORDED EXERCISE SOLUTIONS FOR A TEACHER ASSISTING FEEDBACK TOOL

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ABSTRACT

Exercises are of major importance in teaching. Their correction, however, involves a high effort for the teacher particularly in case of free worded solution texts, which have the advantage that students demonstrate their own knowledge but the disadvantage of a very limited automatic correction on the part of the teachers. A feedback tool that connects the advantages of tasks of free text construction with those processed by the computer can support the teacher in the complex action of correcting since this is effected according to a certain scheme. The feedback tool, based on a pragmalinguistic study of teachers' correction knowledge and actions, assists the teacher by marking different answer possibilities and assigning assessment texts. The prototype of a teacher assisting feedback tool for marking free worded exercise solutions is briefly presented.

INTRODUCTION

Exercises are of major importance in teaching. It can be distinguished between exercises with preset solution possibilities, e.g. multiple choices, and exercises that require a solution text drafted by the students themselves. Free worded exercise solutions offer a considerably high learning effect since students entirely have to resort to their own knowledge, even if the answer consists of only one word, in contrast to exercises with preset solution possibilities, through which the student can only guess the answer. But marking self worded answers solutions requires special knowledge, much time and energy of the teachers. Moreover texts of free worded solutions can merely be evaluated in the simplest way because teaching and learning systems can identify errors simply as formal deviations by comparing the learners' input with the solution preset by the teacher (cf. Klemm & Ruda, 2003, pp. 183–185; Klemm, Ruda & Holly, 2004, pp. 118–125; Narciss, Körndle & Proske, 2004). Therefore, some problems are: If the teacher has not considered ambiguous word combinations, a false solution is though assessed as "correct" since the demanded terms are included, even though the terms were not entered by the student in the designated order and make a wrong sense. If the teacher does not consider correct alternatives, right solutions can nevertheless be marked as "wrong". If a student's answer is assessed as "not completely correct", the corresponding text passages cannot be marked exactly. Furthermore e-learning students' answers are frequently assessed in a very simple way, e.g., "Your answer is unfortunately wrong". All this demonstrates technical shortcomings, the enormous implementation expenditure of a differentiated feedback for every single solution possibilities for all exercises of the (online) course and the involved costs. Therefore a teacher assisting feedback tool for marking free worded exercise solutions could be helpful in solving these problems. This feedback tool shall connect the advantages of free worded exercise solutions with those processed by the computer. For its modeling teachers' correction actions and their knowledge of free worded exercise solutions are analyzed. Some questions are: How is the comparison between the lecturer's and student's solution text made? How are mistakes recognized, analyzed, corrected and assessed? Which actions could be performed by the computer?

METHODS AND PROCEDURES

Teachers' correction actions were determined by consulting a text corpus consisting of offline university examination questions which demand self worded answers with at least one word. I followed the communicative-pragmatic approach that, under certain circumstances, already considers a word or a sentence as a text (Brinker, 2005, p. 18). The research methods included the 'think aloud method' (van Someren, Barnard & Sandberg, 1994) and the 'concurrent record analysis' in combination with the 'focused interview' (Karbach & Linster, 1990, pp. 84 and 87).

14 lecturers produced 15 verbal records which were taped, transcribed and described with regard to actions thus providing analytical transcripts. The lecturers have each revised between three and seven papers. Altogether there are 71 papers from 13 special fields with 488 corrected exercises including subtasks. The tape recordings lasted from about nine minutes up to almost two hours. The average recording amounted to one hour.

This pragmalinguistic analysis is based on Austin's (1962) and particularly Searle's (1969) 'Speech Act Theory' and the subsequent related works by Brinker (2005), Holly (2001), Holly, Kühn & Püschel (1984) and von Polenz (2008). For a detailed description of the analysis and results see Ruda (2008a, pp. 41–208).

A deductive research method was employed since it is regarded to be general knowledge that the teacher revises and subsequently assesses students' solutions. The determination of particular (speech) acts that may be formalized is of special importance. The conversion of certain structures into the feedback tool, on the other hand, was based on the inductive approach since concrete and thus specialized examples were translated into general rules.

TEACHERS' CORRECTION ACTIONS OF FREE WORDED EXERCISE SOLUTIONS

Correcting is often described with only few steps (Kleppin, 2007, p. 55). However, correcting involves many more actions than merely identifying, marking and possibly improving mistakes or grading. The analysis of the present transcripts has shown that correcting consists of five constitutive partial actions in the following sequence:

1. Grasping the complete student's solution attempt or filtering the propositions to be dealt with
2. Comparison with the expected solution
3. Assessment of the student's solution attempt with regard to the definition of the tasks
4. Total assessment of student's solution and
5. Total assessment of all present solutions of a student.

The potential correction actions also include preparations like writing down expected solutions, compiling a criteria grid and determining the approach – paper by paper or exercise by exercise. The envisioning of exercise questions and solutions can take place before the first, second or third partial action. The third step comprises corrections and comments. Remarks concerning the assessment in general can be made at the beginning and/or the end of the revision.

The most challenging action is the individual assessment of a student's exercise solution, which consists of seven areas:

1. Envisioning of the exercise definition
2. Envisioning of the connection between exercise definition and solution
3. Expressing the first impression
4. Grasping the student's solution attempts
5. Comparison with the expected solution
6. Assessing individual parts of the student's solution attempt and
7. Correcting.

It was revealed that there are complex considerations about correct and incorrect facts and forms mainly in the case of problematic and vague solution attempts, which the teachers tried to solve intuitively employing certain problem solving strategies (Ruda, 2008a, pp. 166–185). In order to nevertheless be able to understand problematic propositions, the teachers make certain (speech) acts, e. g.: They name/describe (omitted) (speech) acts of the student. They paraphrase from the student's point of view. They interpret, summarize, explain, specify own solution texts, elucidate the task definition, and search for parts of the solution text which may still be considered as correct.

A feedback tool can support the teacher in the complex action of correcting since this is effected according to a certain scheme. The feedback tool assists the teacher, who has a large number of students and thus many exercise solutions attempts to correct by asking for right, false and vague solutions possibilities. Hence the teacher has more time afterwards to deal with the problematic solution attempts.

TEACHER ASSISTING FEEDBACK TOOL

This feedback tool (Ruda, 2008a, pp. 209–260; Ruda 2008b) is oriented towards free worded exercise solutions whose texts are standardized and brief. It was programmed using „Borland Delphi 5.0".

The feedback tool comprises the three areas of exercise text, solution text attempt and evaluation text (Figure 1). The teacher enters the number and text of the exercise in the first mask "exercise/solution".

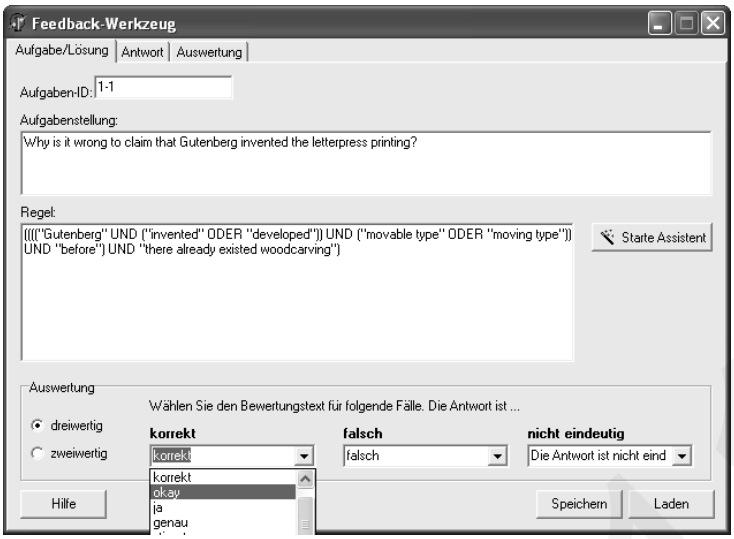

Figure 1: The feedback tool area "exercise/solution".

In the next step, evaluation criteria for the solution texts have to be set. Here the teacher should follow the rules listed under "help" which are based on the pragmalinguistic analysis. The "help" option informs, for example, about the conditions of the feedback tool and the rules for filtering out essential parts of the solution text, e.g., for the distinction between describing and explaining. It also provides hints for editing and further evaluation text suggestions. Moreover the rule assistant can be used. The rule assistant offers Boole's operators resulting in pattern matching:

- AND (UND): *Which words/phrases must be included in the solution?*
- OR (ODER) and PREFERRED (BEVorzugt): *please enter acceptable alternatives to the required words/phrases. If you prefer certain alternatives, please tick them (BEV-Operator)* (Figure 2).
- OR POSSIBLE (ODEREVTL): *Now enter solutions that you would accept even though they are not completely correct.*
- AND POSSIBLE (UNDEVTL): *Now enter solution text parts that may be included additionally.*
- POINT (PLUS): *When would a solution text be particularly good?*
- NOT (NICHT): *Which words/phrases must not be included in the solution?*
  What would not be completely wrong but can nevertheless not be accepted by you?
  What would be a serious mistake?

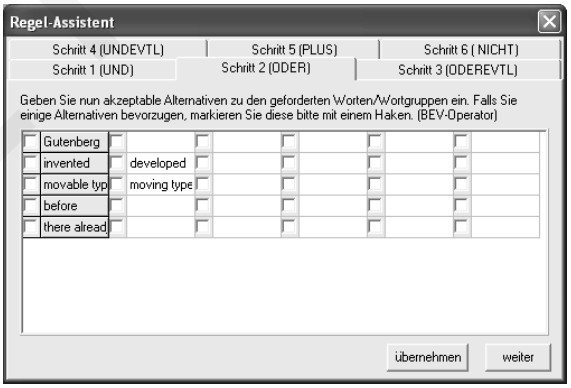

Figure 2: The OR and PREFER mask.

Then the teacher has to decide between the two- and three-valued evaluation (cf. Figure 1). The two valued modus merely concerns the categories "right" and "wrong" and is useful if there are only few correct solutions while all the others can be definitely qualified as false. For all other cases the three-valued modus also includes vague solutions. This selection option is preset since it is mostly applicable

with the present text corpus. In the next step the teacher selects corresponding assessment texts (cf. Figure 1). He can either choose variants from the text corpus or enter his own wording.
The teacher copies the student's solution from a data base and pastes it into the answer mask. If, on the other hand, the feedback tool is integrated into a web based training platform, the student's answer appears directly in the answer mask. The feedback tool evaluates the student's answer in accordance with the agreed rules and shows it in the bottom field (Figure 3).

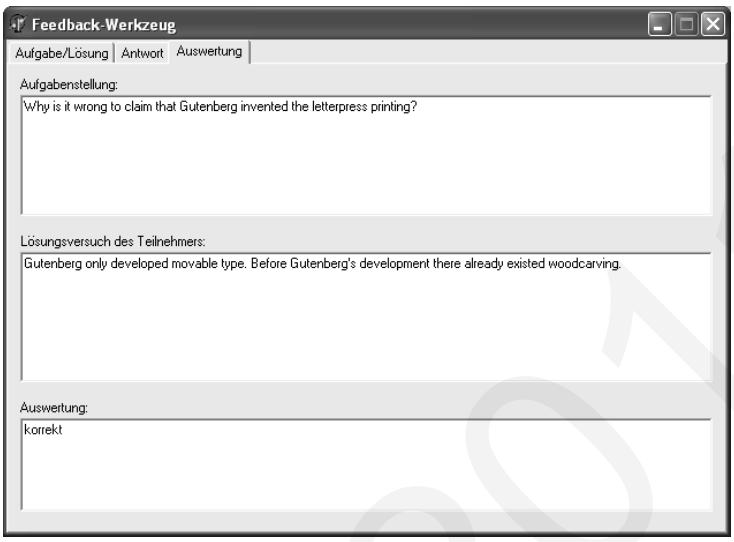

Figure 3: Correct solution.

Students' solution attempts which do not fit into the set framework are returned to the teacher by the feedback tool. The teacher can correct them by hand and then revise and complement the feedback tool with the corresponding rules and data. Therefore the output of non-revised solutions will be reduced with each learner group.

CONCLUSION

It was aimed to design a feedback tool which supports teachers in their correction work by making arrangements with them regarding the solution texts and assessments which requires the acquisition of certain rules and initial training. This means that an automatic correction of all solution texts cannot and should not be expected.
The feedback tool offers the teacher the following advantages: The teacher has to enter relevant solution parts and their corresponding assessment texts only once thus saving time and energy. He does not have to be afraid of a fast fall of his concentration since the feedback tool relieves him of the stultifying comparison of recurring patterns thus allowing him a higher degree of accuracy and objectivity in the correction. The time and energy saved that way can be spent more effectively for nonstereotype solutions.
Benefits for the student: He is urged to make greater efforts answering the exercise than with multiple choice questions, which includes a more thorough preparation. He receives an individual feedback upon which he cannot rest as in the case of sample solutions since he is directly required, e.g., to elaborate on a certain topic or to consult his lecturer. With corrected exercises he can strengthen and deepen his knowledge in a better way thus having a more thorough preparation for future examinations.
This feedback tool is still a prototype and not yet available. The current advancement includes the use of a semantic word net in order to e.g. capture synonyms and statistical data, for example about the frequency of certain students' solution texts.

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TEACHERS' PERCEPTIONS OF THE USE OF TECHNOLOGY IN EDUCATION

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Abstract

The modern era has introduced the implementation of technology in many areas of life especially the education sector. Language learning has been facilitated significantly with the use of technology. This paper seeks to identify what teachers think about their competencies regarding integrating technology in teaching languages; what barriers they perceive while accomplishing this; what kind of expectation they have with their students in learning languages from technological perspective; and, what kind of technological tools do the teachers perceive as easy to implement and use while teaching languages. First an introduction has been given as to what contribution has technology made in education and especially the teaching of language. Then, teachers' competencies and barriers to the integration of technology have been discussed. After that, various technological tools and concept are discussed like CALL, CMI and ICT, which the teachers can make, use of to facilitate their language teaching process.

Introduction

Since the advent of sophisticated technological means, the educators have been trying to modify the instructional process with the help of technology. According to Baker, early 1960's brought with it "new curricula, instructional models, and approaches to individualization" (3) of instruction but the drawback with these instructional schemes was their poor management. An ideal classroom environment is so dynamic in which each student presents his own understanding and is comfortable with his own set of instructional materials. Thus, the teacher needs to organize instructional schemes in such a way that all students with their unique calibers are equally attended to. Before the incorporation of technology in teaching, teachers would process instruction manually but that process was inefficient when it came to collecting and summarizing instructional data for management purposes. This was when the need was felt to construct a reliable, fast and user friendly system which would process and manage modified instruction. Thus, a shift was made toward computer-based data processing or more specifically CMI (*Computer Managed Instructions*), which a lot of educators considered "as a reasonable model for the support of the management functions associated with the individualization of instruction" (Baker). Also, teachers started feeling the necessity of incorporating information and communication technology, commonly known as ICT (*Information and Communication Technology*), in their teaching practice. Kong and Kwok studied teacher perception of the use of information technology in classrooms in a school in Hong Kong and examined this perception under four domains that included "teacher perception of their computer training, computer facilities and assistance available, their confidence and comfortability in using computer in daily lessons, and their perception of their roles in using IT in classrooms." Their survey results supported the idea that teacher perception had a positive effect in the usage if teacher-centered technological approaches in the teaching process. They also found that the teachers and the school administration worked in a collaborative environment for the implementation and usage of IT in classrooms. Another similar research has been conducted by Ismail, Ghaleb and Almekhlafi (37) who studied teacher perception in schools in UAE. They also found that teachers' support and willingness to incorporate technology in their teaching languages is very important to obtain positive outcomes. They discussed the benefits of the usage of IT both for the teachers and the students and found from their qualitative and quantitative research that teacher perception should be considered seriously for better implementation of technological tools in classrooms.

Following is an illustration of various technological concepts that teachers should perceive as important so as to facilitate themselves in their teaching languages.

Computer Managed Instructions (CMI)

Computer Managed Instructions (CMI) is one of the two types of computer based instructions; Computer Assisted Instruction (CAI) is the other. CMI is an instructional scheme that makes use of the computer for obtaining learning resources and objectives, and to assess student performance, thus enabling the instructor to manage instruction in a more efficient way without having to get involved in the teaching process directly. In other words, there is no human interference. To be more precise, it helps the instructor in making effective instructional decisions by providing him with "diagnostic and prescriptive information" by making use of traditional data processing equipment (Prasad114). It includes functions that support the instructional management. These functions include "testing prescribing, record keeping, scheduling, monitoring and time and resource management" (Prasad). For the performance appraisal of the students at regular intervals diagnosis and testing is used. After the analysis of the results the student records are updated. The students are then suggested learning processes that are useful to accomplish their goals.

Teachers who are assisting 50 or more students that are enrolled in two or more courses having 30 teaching-learning units per course, have almost 3000 media assignments to make (Vierling and Shivaram). Thus, teachers feel it important to make use of CMI to manage these assignments. This increases their efficiency and also the quality of instructions given to each student.

Features of CMI

Sieber, O'Neil and Tobias (137) have defined the function of CMI system in the simplest way. They state:

In a computer-managed instruction program the instruction itself is not presented by means of the computer. Rather, instructional materials consist of conventional printed or audiovisual materials. The student sets the pace, and the computer is used to monitor, and to some extent to direct progress through the use of non-computerized instructional materials.

They assert that teachers test and diagnose the student using the CMI system at several places during the whole instructional process so that his strengths and weaknesses may be discovered. Teachers use the CMI system to provide prescriptions to the student to remove any errors they made, and to plan how much and when the student is going to use the instructional resources. They evaluate the students on the basis of their performance and their records are kept and managed. That is why we refer to CMI systems as artificially intelligent systems. The main features of CMI are described below:

- ***Testing***. Executing any new or revised program to check whether all data is processed properly.
- **Prescription generator**. It is based on the comparison between completed training and competency requirements.
- ***Record keeping***. The ability of recording students' details, training history and skill profiles.

How is Instruction Managed?

The steps that teachers go through in the management of instruction by CMI systems include diagnosis of entry behavior of the learners; setting of instructional objectives; generating individualized instructional plans; generating instructional materials and learning experiences; availability of instructional material into curriculum units; monitoring of progress; and, providing remedial instructions (Mangal 541).

What is ICT?

Most simply put, IT provides solutions to process the information while telecom provides solutions to transfer that information. Processing includes management of data (like computing, storage of data in databases, protection and retrieval of data) and its networking. Transfer includes transmission of data from one place/desktop to other using communication techniques. Both technologies are collectively called information and communication technology (ICT) (tutor2u).

CMI and ICT

Teachers perceive that CMI concept is important in the development of Information and Communication Technology (ICT) tools that are being used in educational institutions to provide the

students with the most modern learning environment (Mee Chin). According to Kaka, "education sector can be the most effective sector to anticipate and eliminate the negative impact of ICT. Technology (internet) in another side can be the most effective way to increase the student's knowledge". Teachers feel that students can be made familiar with computer aided simulations and educational games. The objectives of ICT in education are to incorporate latest technology based learning in schools, to endorse literacy about newer technologies in students, to support distance education, and to improve the teaching process by using latest techniques supported by ICT. The main functions of using CMI based ICT in education are the communication and collaboration of students in their activities and the wide availability of resources for teachers (Siraj-Blatchford & Siraj-Blatchford 19).

ICT in the National Curriculum

"ICT has a distinctive contribution to make to the aims of the national curriculum as a whole" (Qualifications and Curriculum Authority). In the national curriculum, ICT has played its role in planning work sequences and learning and teaching procedures. It has helped teachers to make students enjoy their educational activities so that they can relate the technology based learning to their everyday lives. Teachers perceive that students should be able to develop their own independent thinking regarding research, analysis of problems and decision-making. The national curriculum has put forth such programs of study that use ICT to enable the teachers to make students develop self-confidence and think about new ideas. The ICT based study programs in the national curriculum support safe usage of digital communication technologies. The curriculum has made it possible to use ICT in making the teachers and students familiar with the growing utilization of technology.

Example- ICT and Education of Children in Primary School

The national curriculum has proposed efficient study programs for children in primary school (Key Stage 1 and 2). ICT should be introduced to the child right from birth to enable him to understand the needs and demands of the new world. ICT has already become a part and parcel of young kids' lives. Introducing ICT concepts at so young an age helps children discover, examine, explain and solve problems, foresee, argue and judge. For primary school children, that is, key stage 1 and 2, it should be the decision of teachers where to make use of ICT tools to support their teaching process. According to Harriet Price, ICT in early years helps children enhance their independence in their use of ICT tools like digital cameras, digital images and role-play toys; develop creativity in areas like art, dance, writing and music; and, improve their outdoor learning experience using appropriate ICT tools.

For teaching math, teachers can download softwares which deal with making young children familiar with patterns, sequences, addition, subtraction, ordinal numbers and memory games. *Dinosaur Numeracy* is a software that helps teach children the add-1-and-take-1-away lessons. *Right Angle Monsters* helps children learn about right angles in a very interactive way. In this software, students search through the classroom for an item which fits accurately in the monster's mouth and if it does, then it is a right angle. Teachers can use *spreadsheets* and *interactive whiteboards (IWB)* to help children learn numeracy while interacting with one another. *Math board games* such as dice games, bingo and calculator games, geometry games with interactive layout can be used to help children take hold of main arithmetic and geometry skills together with times tables, word problems, ratio, percentage and mental addition. *CD-ROMs* are another important resource which teachers can use to store their math lessons. For teaching science, teachers can use activities like *Animal Magic* that are easily available online. This particular activity asks children to sort out and name animals. It uses animations to attract the interest of kids. Teachers can use *interactive science games* about life processes, living things and physical processes. Students at key stages 1 and 2 can be encouraged to use *digital cameras* and *video cameras* at zoo trips and then write their experiences with the help of videos they make. Presentation tools like *PowerPoint presentations* and *multimedia* can be used to teach using slideshows and simulations. *Computer-controlled microscopes* can be used to observe microorganisms.

Functions and Dysfunctions of Using Technology in Education

The main functions of using technology or ICT in science are the communication and collaboration of students in their science activities and the wide availability of resources for teachers (Siraj-Blatchford & Siraj-Blatchford 19). But, Jenkin states that "judgments need to be made about when and (more importantly) why ICT should be used. It should only be used when appropriate: meaning when and if, it

allows the teacher or the pupils to do something they would not otherwise have been able to do". Armstrong and Casement have argued that the extensive use of computers in schools has brought forward very expensive and useless change in the education history and that the continuous control of children's minds and habits by the screen culture has damaged them psychologically, neurologically, physically and generally. Staying in front of the screen for longer hours has hindered the speech and language development of young children (Healy). In teaching science, a disadvantage of technology would be that it may restrict children's own observation. Similarly, while learning math, if only technological resources are used, then the children may get weak in writing math which is a very important path for the learning process in case of math. Math cannot be learnt without pen and paper. Another dysfunction is lack of sufficient computers, hardware and software and lack of teachers' skill, competency and time in teaching using these resources (Bingimlas).

Technology and Students with Special Needs

Teachers believe that with the growing use of technology in schools, there is no reason why children with special needs should be ignored. There are a lot of technological tools available in the market and online that help children with special needs adapt to their new learning environment which is more efficient and more helpful to them. These tools help children who find difficulties such as language hurdles, cultural hurdles, writing trouble (dysgraphia), reading difficulties (dyslexia), math difficulties (dyscalculia), memorizing difficulties and environmental disadvantages (Namibia Training Authority 11). Special needs may be both physical and mental. Technological resources, like internet, discussion forums, special interest groups (SIGs), educational softwares and e-learning centers, have helped a great deal in meeting the needs of these special children.

Conclusion

To sum up, teachers are getting more and more aware of that technology is an important part of the national curriculum and provides great resources for learning and teaching processes. Children can be made well equipped with up-to-date information while being able to conduct their own research, do analysis, make decisions, share ideas and views, and learn to be creative and initiative using technological tools in their study. Teachers can use technological resources to teach more efficiently with good outcome. Technology is becoming inevitable in the educational and personal lives of students thanks to great advantages it offers. To sum up, ICT is an important part of the national curriculum and provides great resources for learning and teaching processes. Children can be made well equipped with up-to-date information while being able to conduct their own research, do analysis, make decisions, share ideas and views, and learn to be creative and initiative using ICT tools in their study. Teachers can use ICT resources to teach more efficiently with good outcome. ICT is becoming inevitable in the educational and personal lives of students thanks to great advantages it offers. And this is what Sir Jim Rose also suggests in his interim report.

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TECHNICAL EDUCATION IN JORDAN: OVERVIEW, SWOT ANALYSIS, AND RECOMMENDATION FOR IMPROVEMENT

By
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Abstract

One of the most crucial problems facing educational systems and workplaces in Jordan is the unbalanced equation between the enrollment rate in technical education at community colleges and the enrollment rate in general education. The enrollment rate in community colleges was about 11% in 2005. while , the enrollment rate was 89% in general education (four and five-year university programs). 75% of them were enrolled in humanities and science programs. One of the main reasons for a low level of enrollment in technical education programs is the public point view of technical education as "hand-work" and dead-end applied education . This paper presents an overview of community colleges education and discusses the of technical education in Jordanian community colleges perspectives. An analysis was performed to determine strengths, weakness, opportunities, and threats (SWOT) of this type of education in Jordan. As a result of this study , an action plan was recommended to improve technical education in Jordan .

One of the most crutial problems facing educational systems and workplaces Jordan is the *unbalanced equation between the enrollment rate in technical education at community colleges and the enrollment rate in general education. The enrollment rate in community colleges was about 11% in 2005. while 89%.,of the enrollment rate in general education (four and five-year university programs) 75% of them are enrolled in humanities science programs. One of the reasons for low enrollement in technical education programs is the traditional pointview of* technical education as "hand-work" and of applied education as a dead-end. This paper presents *an overview on education in community colleges and discusses the perspectives of technical education in Jordanian community colleges. An analysis was performed to determine strengths, weakness, opportunities, and threats (SWOT) of this type of education in Jordan. As a result of this analysis, an action plan to improve technical education in Jordan was recommended.*

Introduction

Human capital can be built by individuals who have the skills and knowledge needed to be compatible in the labor market. Moreover, human development is a major factor in any workforce development effort. Obviously, the education sectors are the main source of high-quality graduates. According to Schultz (1961), with regard to the role of education in human capital development, an investment in education is one strategy that promotes employers' productivity and income. He defined this strategy by stating that an investment in education is truly an investment in human capital, which means that students gain the necessary skills through

theoretical learning, experience, and training, and thereafter become valuable employees in the market place (Schultz, 1961).

On the other hand, there are many examples throughout the world countries that do not have natural resources but depend on their high-skilled workforce to improve their country's economy. For example, Korea, Taiwan, Singapore, and other Asian countries are doing very well after transferring their economies from traditional to light-industry and electronic-based economies. According to Gray and Herr (1998), one of the most important elements in components capital is human capital, the need for technicians who are bled to push the industrial wheel. In Jordan, the old vocationalism began to unravel when student enrollment in vocational education declined suddenly and dramatically. Students and parents concluded that jobs in traditional vocational education were disappearing. The public is always concerned about those who make more money than others. The only thing that seems to be at all certain is the increasingly publicized fact that universities graduates make more money than community colleges graduates.

The community college's concept is not an emerging one; however, it has a deep history that goes back for more than a hundred years. The community college evolved from at least seven sources of educational innovation. Two began in the 1880s and 1890s: (1) community boosterism and (2) the rise of the university research. Three came from the educational reforms of the Progressive Era (1900–1916): (3) the initiation of universal secondary education, (4) the professionalization of teacher education and (5) the vocational education movement; 8, (6) open access to higher education, and (7) the rise of adult and continuing education and community services, were primarily post–World War II phenomena (University State?, 2005).

Jordan is one of the smallest and less affluent economies in the Middle East with close to 15% of the population living below the poverty line. Jordan spends 6.4% of GDP and 13.5% of total government expenditures on education, which is higher than the average for countries with similar population and income levels. Enrollment rates at each level of education are consistent with other countries at similar income levels, but population growth and socio-economic pressures are placing high demand for further expansion and improvement of infrastructure, programs and services. Jordan is well on its way to achieving the Millennium Development Goals in terms of primary completion rates and the elimination of gender disparities in education. In 2004, UNESCO ranked Jordan 18th out of 94 countries in the "Education for All" rating for gender and education, indicating that Jordan provides equal learning opportunities for males and females.

It is clear that additional and continuous improvement of the quality of education will be essential to support overall national economic development aspirations for employment creation, stimulation of economic diversification, income generation and reduction of poverty through increased regional and global competitiveness. To enable and support economic growth, the local labor market requires a supply of well skilled and highly motivated graduates; currently there are far too many youth and young adults who cannot meet the demands of the workforce or the entry requirements for higher education institutions.Jordan has a total of 28 universities as of 2010, : ten public universities and , sixteen private universities , and two regional universities. The University of Jordan was the first established in 1964. A public university is established by a decision of the cabinet and endorsed by a royal decree. Private higher education started in Jordan in 1989, and establishing a private university requires a decision from the Board of Higher Education. As for community colleges, there are 47 *community colleges : 9 governmental, 15 follow Al-Balqa Applied University, 2 follow the United Nations Relief and Works Agency (UNRWA) for Palestinian Refugees, and 21 private colleges.*

, The mission and the main goal of the community college is to prepare the nation's workforce and to ensure that a nation's workforce remains globally competitive (Walker, 2005, p. 16). In light of that meaning, developing highly skilled technicians should occur mostly in community colleges by providing knowledgeable and highly specialized laborers. Gray and Herr (1998) pointed out that the workforce is a form of pedagogy that is provided at a pre-baccalaureate level to increase individual opportunity in the labor market or to solve human performance problems in the workplace (Gray & Herr, 1998, pp. 27–41). In addition, there must be positive growth in the education system in order to enhance the social and economic development of any country's workforce, . According to Alheeti and Brock, ―Education is a tool to aid the

workforce 3 development. CTE is intended to feed the work pyramid, and it is an essential step in building realistic workforce (Alheeti & Brock, 1997, p. 373).

The educational systems in Jordan established community colleges many years before establishing universities. Many community colleges were established as teachers' preparation institutes before the first university was instituted in 1962. As mentioned previously, debate about many issues related to community colleges occurs on a day-to-day basis and at all levels in Jordan and in the UAE as well. For example, in Jordan more than 192,000 students are enrolled in 29 Jordanian??? universities IN 2005, 75% of whom are studying topics in the Social Sciences and Humanities. While approximately 24,000 students are enrolled in about 55 community colleges, the majority of those graduate as technicians (Ministry of Higher Education, Annual Report, 2006). Despite the fact that enrollment in the CTE system in Jordan is considered one of the highest enrollment rates among other Middle Eastern countries (11.1%, when ??) for general education, this rate is still lower than policy makers' expectations, while the rate of enrollment in this type of education, as example, in the UAE a decade ago was less than 1% in general education (UNESCO, 1998). Unfortunately, an extreme shift in direction occurred in the last three decades from technical education to general education, in which technical education is considered to be the last destination for students who do not succeed in general education. Likewise, in 1995 about 38,276 students were enrolled in four-year universities and about 68,385 were enrolled in two-year community colleges. Today, the number of first-year students enrolled in 24??// public and private universities is 51,131 students while the number of first-year students enrolled in community colleges is 24,259 (Ministry of Higher Education, 2009).
Furthermore, previous studies have shown that in 2001 and 2002, 19,359 students were enrolled in community colleges whereas 44,761 students were enrolled in universities. Almost 98% of these students graduated from general education programs with no technical background and have no idea about their career target. In addition, most of the enrolled students in colleges are in general education. It has been estimated that fewer than 2% are graduates from vocational technical education schools (Cameron 2005). In these two countries, people still believe that their children's future will be in white-collar jobs that provide them with high-social-status , prestige and more financial benefits.

The same issue exists in the United States; Gray reported that between 1982 and 1990, the national percentage of students enrolled in college preparatory programs increased by 10%. During the same period, enrollment in vocational education programs declined in 32 states. Gray (1998) argued that students and their parents believe that future jobs with some potential for decent standards of living require this course of action.

Students who wish to pursue their profession in vocational education join a community college after successfully completing high school. Vocational higher education is available in Jordan in a number of specialties, such as administration and finance, agriculture, applied fine arts, applied sciences, engineering disciplines, hotel management, information management and libraries, para-medical subjects, shari'a and Islamic civilization, (other specialities …..) etc. In Jordan, the 52 ??community colleges were established on concepts directly inherent to the community college system in the United States.

In the community colleges, students may enroll in one- or two-year programs at community colleges. Students receive a diploma after successfully completing the program requirements. In the case of two-year programs, which is the most common, students have to pass a national exam in order to receive a certified diploma by the Ministry of Higher Education. A small percentage of students who successfully completed the national comprehensive exam may be admitted to regular programs at a university to study towards a Bachelor degree. The Ministry of Higher Education issues the "bridging" regulations that govern recognition of the courses studied in community colleges to be counted towards the new degree.
One of the vital goals of applied education is to prepare well-educated and highly skilled individuals for the labor market. However, this goal may be influenced negatively by the debate about this system's capability to carry out the mission of supplying the labor market with a highly skilled workforce. Educators complain about the quality of the students enrolled in CTE programs, onone hand; on the other hand, employers complain about the lack of skills, knowledge, and attitudes of the newcomers. Debate on the role and effectiveness of postsecondary education in two- and four-year institutions of higher education fills the air either in the U.S. or other developing countries. Despite the lack of studies on this issue in the two countries,

the rate of unemployment and rate of enrollment in community colleges and in CTE indicate that there is a problem that faces this sector. In the U.S., two camps address this issue; one camp advocates for community colleges, technical education, workforce education, and vocationalism. Education-to-work through community colleges in this perspective is viewed as a remedy for labor market problems such as shortage of the skilled workers, . According to this view, the future holds promise for technicians equipped with the theoretical knowledge and practical skills to compete in the local and international labor market. On the other hand, other groups are not satisfied with community colleges performance and outcomes. The community college, in its current shape, is seen as a work-mind institution that produces semi-skilled individuals who lack the theoretical knowledge to improve themselves or to participate effectively in the labor market (**Al-Alawneh, and Alhawasin**, ???).

Academic staff in Community Colleges

The majority of academic staff (around 70%) have Doctorate degrees(its not PhD??? (PhD) from institutions that are recognized by the Ministry of Higher Education, while a small percentage only hold a,Master degree. Staff members who hold a Master degree are appointed with the rank of*Lecturer*. When a staff member is appointed after obtaining a PhD, he/she is appointed withthe rank of *Assistant Professor*. After four years of service at the university and publishing number of papers in international journals and conferences, he/she may apply for promotion. After an internal and external assessment of the candidate's profile, he/she may be promoted to the rank of *Associate Professor*. After a similar period and comparable number of publications or more, a candidate may be promoted to the rank of *Full Professor*. Staff members may be tenured one year after their promotion to the rank of Associate Professor, provided they have a good record of teaching and community service. Although faculty members are appointed in regular jobs, they remain under probation for at least six years until a decision is made by the Dean's Council to grant them *tenure*, after which they become permanent. The Deans' Council makes decisions regarding the appointment, promotion, and tenure of faculty members. But before that, the relevant departments and faculties make their recommendations concerning all issues related to faculty members. As an example, the quality of teaching and research is firstassessed by faculty members in the faculty concerned. Only faculty members who have a higher rank than the candidate participate in such assessments. Theoretically speaking, the appointment of a faculty member may be terminated before tenure, but practically this is rather difficult to implement.

Significance of the Study

This topic is significant because it focuses on one of the critical issues in many educational systems, and most specifically those that hinder CTE community college graduates from pursuing higher education, which affects the quality and number of students enrolled in community colleges and CTE. Therefore, the focus of discussion will be on the community college system and four-year university system. The study will then demonstrate new trends relating to the community college

Research Objectives

Based on these two perspectives, the current article aims to answer the following questions:

1. What are the current perspectives about community colleges systems in Jordan?

2. To what extent is the current situation in Jordan aligned on this perspective in terms of the enrollment rate and number of the graduates from both systems.
3. How could a new transformation relating to the community colleges assist in resolving the current situation, which hinders applied education program graduates from pursuing their education?

SWOT Analysis

SWOT analysis can be simply understood as the examination of an organization's internal strengths and weaknesses, and its environments, opportunities, and threats. It is a general tool designed to be used in the preliminary stages of decision-making and as a precursor to strategic planning in various kinds of applications (Johnson et al., 1989; Bartol et al., 1991). When correctly applied, it is possible for a community colleges to get an overall picture of its present situation in relation to its community, other colleges, and the industries its students will enter. An understanding of the external factors, (comprised of threats and opportunities), coupled with an internal examination of strengths and weaknesses assists in forming a vision of the future. Such foresight would translate to initiating competent programs or replacing redundant, irrelevant programs with innovative and relevant ones.

The process of utilizing the SWOT approach required an internal survey of strengths and weaknesses of the program and an external survey of threats and opportunities. Structured internal and external examinations are unique in the world of curriculum planning and development.

A SWOT analysis can be an excellent, fast tool for exploring the possibilities for initiating new programs in the community colleges. It can also be used for decision making within departments and committees or even by individuals. A SWOT analysis looks at future possibilities for the institution through a systematic approach of introspection into both positive and negative concerns. It is a relatively simple way of communicating ideas, policies, and concerns to others. It can help administrators to quickly expand their vision. Probably the strongest message from a SWOT analysis is that, whatever course of action is decided, a decision making should contain each of the following elements: building on *S*trengths, minimizing *W*eaknesses, seizing *O*pportunities, and counteracting Threats. In order to be most effectively used, a SWOT analysis needs to be flexible. Situations change with the passage of time and an updated analysis should be made frequently. SWOT is neither cumbersome nor time-consuming and is effective because of its simplicity. Used creatively, SWOT can form a foundation upon which to construct numerous strategic plans for the vocational school. Historically, administrators seek to attract students to their college programs, without paying any heed to their institution's strengths and weaknesses. If, indeed, such internal audits are carried out, areas requiring some changes reveal themselves. Furthermore, the potential and possibilities for new services and programs may also emerge. Making a list of internal weaknesses could reveal areas that can be changed to improve the community colleges performance, also some things that are beyond control.The SWOT analysis covered all of the following areas, each of which may be a source of strengths, weaknesses, opportunities or threats:

Internal environment of the institution

1. faculty and staff
2. classrooms, laboratories and facilities (the learning environment)
3. current students
4. operating budget
5. various committees
6. research programs

External environment of the institution

1. prospective employers of graduates
2. parents and families of students
3. competing colleges
4. preparatory high schools
5. population demographics
6. funding agencies

THE INTERNAL SURVEY OF WEAKNESSES AND STRENGTHS

The external environment has a profound impact on educational institutions. During this final decade of the twentieth century, Jordanians education institutions did not sufficiently respond to changes in economy, social, political structures, and even individual lifestyles. Recent world shifts from an industrial to an information-based society and from a manufacturing to a service-oriented economy has significantly impacted the demands made on vocational program offerings (Martin, 1989). Community colleges, generally, cover a broad spectrum of service areas, but they provide fewer overall programs. Existing programs, and those planned for the future irrespective of the type of school, should be based on a careful consideration of future trends in society.

Strengths

Seldom strengths are present and need to be enlisted as well. Examples of potential strengths could be:

- High-skilled/high-wage graduates
- Reasonable tuition fee charged from students. Community colleges dropout many of education expenses and reduce its period by 50% or more.
- Strong and dedicated faculty with a high morale;
- Articulation with other four-year colleges and universities which would enable students to transfer course credits in some programs;
- Strong reputation for providing the training required to get entry-level employment in some programs; and

 Community college and baccalaureate attainment.

 Advocators believe that the economy needs technicians more than professionals. Community colleges are the main contributors to the workforce preparation activities. Community colleges were viewed as gatekeepers for the skilled jobs of the future and a primary source of advanced technical training. Community colleges improve its graduates socioeconomic status and income, in addition to improve education outcomes.
 Community colleges can play significant role for non-credit continuing education and job training.
 Meeting the needs of low-income workers and those displaced from traditional middle-class jobs because their manufacturing plants have closed. This perspective views the community college as an institution that can lift such people out of poverty by providing both basic education and occupational training.
 Diversity among the student population.

Weaknesses
In many programs offered in the community colleges, the quality of education that students are receiving today is not focused and even poor. In fact, we see that the education system is failing to fill the gap in some major occupations because the programs' aim is to obtain a higher education degree.
 Many four-year colleges and universities have selection criteria for attendance, such as a minimum required GPA, community colleges are either open to everyone or requires less GPA.
 How to develop comprehensive exit examinations that cover any number of courses students may take;
 Needs for remedial courses in some programs.
 How much emphasis to put on community services;
 Unemployment of community college graduates in some areas.
 Community colleges are believed to be static and not following new trends in the labor market, resulting in a weakness in competing with other competitors.
 Many high schools graduates and their parents believed that 4 or 5-year degree graduates will have better and more promising future.
 4 or 5-year degree graduates have more prestigious and highly paid in the long run.
 4 or 5-year degree graduates have higher Socioeconomic status (SES)

EXTERNAL SURVEY OF THREATS AND OPPORTUNITIES

Threats need to be ascertained. They come in various forms. Increasingly, restrictive budgets for vocational education are a rule rather than an exception. An anticipated cut in governmental funding can have a significant impact on implementing a high-budget program. Nearby universities and other local area colleges may be planning some new changes to attract more students to their programs.
An awareness of demographic changes in the local population can reveal potential opportunities to address new issues and pave the way for a more meaningful education. There could exist a pattern of preferences among the various minority or cultural groups. Public concern for the global environment is relatively new and this may represent an area of opportunity. Newer industries or businesses could emerge in the near future, seeking well-trained graduates.
It should be recognized that opportunities and threats are not absolute. What might at first seem to be an opportunity, may not emerge as such when considered against the resources of the organization or the expectations of society. The greatest challenge in the SWOT method could probably be to make a correct judgment that would benefit both the institution and the community.
Stakeholders and policy makers doubted the future of career and technical education in community colleges because they believed it is static and not following new trends in the labor market, resulting in a weakness in competing with other competitors. Moreover, community colleges were viewed as gatekeepers for the skilled jobs of the future and a primary source of advanced technical training (Bragg, 2001). On the other hand, some advocate a renewed focus on meeting the needs of low-income workers: inner-city residents, new immigrants, and those displaced from traditional middle-class jobs because their manufacturing plants have closed. This perspective views the community

college as an institution that can lift such people out of poverty by providing both basic education and occupational training (Badway, Grubb, & Bell, 2003).

Strategies must be developed to ensure that institutions will be responsible to the needs of the people in the year 2011 and beyond. To develop these strategies, a SWOT analysis should be performed. As part of this analysis the challenges facing community colleges education in Jordan should be defined. The main challenges are:

- ***Admission policies do not offer*** equal opportunities to all applicants.
- Weak or absence of quality assurance system in education programs at community colleges.
- ***Weak scientific research and development*** environment.
- ***Shifiting of many programs*** in community colleges from technical education towards classical academic programs offers at other universities in Jordan.
- ***Insuficient funds to community colleges to*** establish high quality programs and cover expenses of low income students who can not offer paying the college fees.
- *unbalanced equation between the rate of enrollment in community colleges and the rate of enrollment in 4 and 5 years universities programs*. This due to low percentage of students who wish to enroll in vocational education programs. This problem most likely is arises both in the home and school. That is, if parents are not satisfied and feel uncertain about the future of technical education in high schools and community colleges, they will not encourage their children to go into that type of education, on the one hand.

- ***Poor colleges environment*** to build the students characters and reinforce loyalty and democratic practices.
- In most cases, the education in community colleges are not opened to a higher level of education in other words this type of education is perceived as a dead-end such that educational systems provide very limited options , the consequences may include the quality-in and quality-out of the graduates and in the low-rate of enrollment in this kind of education.
- Misconception about community colleges' current situation. In Jordan, negative attitudes toward community colleges are rational because community college graduates have a lower status than four or five-year college graduates. Community and businesses are viewing these schools as a last destination for non-successful students. This factor has influenced community colleges as well as belief that the four-year university program is the only one that can help them find the right job. This misconception also exists widely in the United States. Gray and Herr have stated this same misconception of community colleges and reported important facts and numbers regarding education outcomes for four-year university and two-year community college graduates. They have also shown that many jobs do not require a college degree (four-year university); only 22% of jobs required a college degree in 2005. Furthermore, they assured their readers that the future labor market will not pay for education per se with above-average wages but it will do so for occupations that require skills that are in demand (pp. 84–88).
- Uncertainty in remaining the economy strong enough to generate sufficient employment for those graduating from community colleges.

Despite these hurdles, Jordan's community colleges are viewed as an investment that ensures both the social prestige and economic security of the country and its people (Badran, 1989).??????

Recommendations

The National Strategy for community colleges should be revised and campaign to support the reform process The education in community colleges should be pillar of the national ETVET strategy, which emerged from overall system movement towards, the National Agenda. and eventual compliance with, targets for access, equity, social and economic inclusion, relevance, and ultimately quality, as measured by a variety of system approved standards for performance and assessed by competencies, results, and achievements which can be achieved through:

 Connecting education to work and connecting applied education to higher education levels. Many solutions have been suggested for moving the barrier between the two types of education. Recently, a promising trend in territory education is taking place through what has been called the community college baccalaureate‖. Colleges are offering bachelor degrees in many fields that require wide theoretical knowledge and solid practical experiences, such as teacher preparation, at all levels.
 Structuring the educational system to ensure **lifelong learning**
 Ensure **responsiveness** of the community colleges educational system to the economy. This can be achieved by mapping the relationship between vocational education and the labor market. Mechanisms for more systematic longer term tracer studies to provide ongoing information on links to the labor market should be implemented.

 Transform the Community colleges to Produce Labor Market Relevant Skills, by aligning the community colleges with the needs of a changing labor market in an emerging knowledge economy. This can be achieved through:
(i) Developing policy component by drawing on the best international experience, trends in the region and specificities of the Jordanian context;
(ii) Run a series of pilot initiatives to test various institutional options for reform;
(iii) Create institutional linkages to employers, other training providers, and other VET reform initiatives; and
(iv) Form linkages with other TVET work in Jordan (i.e. Vocational high schools, and the Vocational Training Corporation).

 Identify key policy directions with respect to the transformation of the community colleges education system to meet the requirements of what had been identified as the knowledge economy.

 The internationalization of the market and the other is the variety of institutes that provide online degrees in a wide variety of areas

 The education in community colleges should be directed to prepare individuals for competition in the local and global labor markets in order to improve a nation's economy.

 Rremedial English and mathematics courses, in addition to provide the right resources and services to support individual student learning needs through special education, remedial and alternative ways for credentialing student achievement.

 Evolution off a publicity campaign to encourage enrollment in community colleges. This campaign should cover all Jordanian high schools, with particular attention paid to the role played by students' parents.
 Community college workforce development mission should include all of the institutional programs, courses and activities that prepare students for work.

 Governance and administration to ensure the financial and academic autonomy of universities.
 Admission standards to develop admission criteria for achieving fairness and equal opportunity.
 Accreditation and quality assurance to develop a quality assurance system and apply it to all institutions and programmes of higher education.
 Moving to an outcomes-based curriculum from an input-focused model of education
 Adopting a learner-centered approach to curriculum, teaching and learning
 Implementing a "core" curriculum, the learning outcomes of which can be met through different approaches with many different learning resources, and a "supplemental" curriculum to meet the various learning needs of different individuals.
 Support for the central place of the learner in outcome-based education through review and further renewal of program structure and curriculum scope, sequence and content, diversification of core and supplemental learning resources, teaching methodologies and assessment strategies, and new or

renewed programs in career, physical education and health, and others areas that fulfill the needs for holistic education for all students.
 Implementing the role of teacher as the "facilitator" and "guide" for learning from a role of teacher as "provider" of information;
 Recognizing the "professional" nature of instructors through an effective ranking and rewards system as compared to a civil service view of human resource management; In other words, it is important to recognize achievement and reward excellence among teachers and other educators.

 Investing in quality continuous professional development of education staff (teachers and leaders) rather than accepting pre-service training as sufficient to meet the needs of learners. Training program should be designed and implemented for both new and in-service instructors; Teacher training programs should be broad based programs and specialized vocational courses.

Utilizing technology as a an integral part of the education and learning process and as a tool to support/enhance learning;
Scientific research, development, and graduate studies to improve the research environment, encourage research teams from varied specialisations, and support excelling graduate students in various higher education institutions.
Technical and technological education to revise specialisations in community colleges and gear them towards technical education.
 Incorporating a "lifelong learning" approach to the provision of education
Improve Poor colleges environment to build the students characters and reinforce loyalty and democratic practices. This can be achieved through learning environment initiatives that provide additional general and dedicated facilities (schools and extensions), for student enrolment and appropriate program delivery and that will ensure universal connectivity and expanded ICT resources for learning.

 Poor colleges environment to build the students characters and reinforce loyalty and democratic practices.
 Parents and educators should find a way to guide children and students to be employable in the future.
Education-to-work as represented community colleges should be opened to a higher level of education than is currently the case. On the other hand, if this type of education is perceived as a dead-end such that educational systems provide very limited options , the consequences may include the quality-in and quality-out of the graduates and in the low-rate of enrollment in this kind of education.
 Information about the current business climate, demographic changes, and employment and high school graduation rates should be considered in this phase of the study. A multitude of sources include, but are not limited to, parents and community leaders, local newspapers, national news, conferences, the local industrial advisory council, and local business contacts. Each of these is a potential source of highly valuable information.
 Reduction and refocus of the vocational education programs to maximize the emphasis on relevant skill and competencies through curriculum renewal supported by targeted initiatives in teacher training and equipment and resources deployment

Design a strategy to convince students and parents that academically average students who enroll in integrated tech-prep will have high-skill/high-wage careers and thus see the advantage of a technology associate degree over a baccalaureate degree.
 Increase engaging various stakeholders in determining the direction, design and delivery of education.

 Increase the focus on cost-efficiency measures within the educational system to acquire resources for quality enhancement activities rather that depending on annual increments to the education budget as the sole source of funds for educational improvements.

 Development and implementation of an integrated information management system to incorporate current and future specific information systems and provide the basis for modeling policy options and supporting policy decision making, implementation and assessment.

 Review of current structure, processes of Al Balqa' University with respect to central directorate roles and functions, and develop, and implement new ones, and consider development of specialized well-equipped regional community colleges that will replace smaller colleges programs that are outmoded, under-equipped and under-resourced
.

 Implement of mentoring and evaluation system. Make continuous assessment and reflection on actions a habitual practice; Keep performance standards at the forefront of activities;
 Accessing and utilizing information and communications technologies to support
effective learning and system management; **Develop a range and variety of enduring public-private partnerships;**
A Public-Private Partnership is an effective way to build an appropriately skilled, demand-driven workforce that meets the needs of the private sector. A successful example of Public-Private Partnership brings together: Al-Huson University College (AHUC); Consolidated Contractors Company and the Morganti Group Inc. (CCC/MORGANTI); and USAID Jordan Economic Development Program (SABEQ). The Partnership enhances CCC/MORGANTI with its corporate responsibility initiative in Jordan as well as addressing CCC/MORGANTI's labor force needs from Jordan and in the MENA Region.
Consolidated Contractors Company and the Morganti Group Inc. (CCC/MORGANTI), the largest construction company in the region, it needs more pipe fabrication supervisors on large construction sites. In the meanwhile Al-Huson University College (HUC) working on increasing the number of jobs available to the college graduates. In this capacity, CCC/MORGANTI to Al-Huson University College (AHUC), introduced employer-specific training programs.
The first task was for the partners to clarify their roles. The Career Development Center recruits and enrolls program participants, and provides training on computer skills, workplace preparation, and English proficiency to students. The college provides classroom and laboratory space, renovations, rent and utilities, and collects student fees. The construction company supports up-front costs needed to get the program underway (e.g. specialized curricula; equipment; training for University instructors).
The first patch of graduates from this program were 18, most of them appointed in the Consolidated Contractor Company with a starting salary of more than 1,500 US$.

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TECHNOLOGY ENHANCED LEARNING: THE CASE STUDY OF ENGLAND AND NORTH CYPRUS

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ABSTRACT

The purpose of this research was to explore how and why (under what circumstances) Information and Communication Technologies (ICTs) are being used in secondary schools, through a comparative analysis between experience in England and North Cyprus. Furthermore, the study aims to explore any differences between the practitioners in their beliefs about pedagogy and their use of ICT and how these beliefs shape their approach in the classroom. The researcher also has the aim to raise awareness, particularly in North Cyprus, of the opportunities for ICT to be used to enhance learning and, through sharing practical experiences in each country, discover how these technologies can be applied effectively and integrated with subject teaching in the respective learning cultures.

It draws on the interpretive paradigm (Cohen & Manion, 1994), where the focus is on how people interpret and make sense of their world. From this interpretive perspective the beliefs of England and North Cyprus secondary school teachers were investigated.

Two England and two North Cyprus secondary schools' teachers have been involved in this study. The teachers were asked to voluntarily participate in the study and 121 out of 167 (44 male and 77 female, 72 %) completed the questionnaire. The results of the questionnaire were used to justify selected schools and select participants for the interviews. 3 teachers from each schools (12 in total) whose competence (self-rated) level was high, medium and low and who indicated in the questionnaire that they would be happy to participate in the interview process were selected to participate. Analysis of the data, together with the relevant literature builds a picture of the use of ICT in teaching a pedagogy-led way in secondary school education. Providing ICT hardware and software resources to a school is not enough to ensure significant integration in use of ICT for teaching and learning in classrooms. Access to working ICT continues to be an issue for Turkish Cypriot teachers where integration ICT into teaching continues to be an issue for British teachers. Although teachers identified many benefits to teachers and students from using ICT and had made individual efforts to develop their use of ICT for lesson preparation, they also identified barriers. These barriers focused on a lack of appropriate professional development, technical support, availability and accessibility of recourses.

It is expected that the results of the research will guide future research and development in two countries especially in North Cyprus and outline the importance of the use of information and communication technology in education for teachers and students and particularly provide lessons plans of use of ICT in teaching pedagogy-led way for teachers. It will contribute information towards planning in future projects.

INTRODUCTION

Information and communication Technologies (ICTs) are believed to be an important set of tools for improving teaching and learning in education and their integration in school teaching has been championed in developed countries for at least two decades (UNESCO, 2003; Isman et al., 2007). After the announcement of the National Grid for Learning (NgFL) in 1997, there has been a sustained drive to equip all UK classrooms with a range of ICTs including access to high-speed internet connections in the belief that this would lead to benefits for learning. Many other countries have taken similar initiatives to provide ICT to schools as a means of improving the quality of education. The impact of these policies on learning remains

hard to demonstrate for a number of reasons (Pilkington, 2008). In particular, barriers to effective use of instructional technologies are shifting from access to ICT to basic training. Once basic ICT training skills are obtained, it shifts to appropriate use of instructional technology in the classroom to help with subject teaching and enhance student learning (ibid). However, the use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.

In North Cyprus, similar efforts like the England government have been undertaken by government but the lack of financing and understanding of the benefits of ICT in education are preventing the integration of technology into all schools. Only a few research studies have been conducted to demonstrate that educational technology, as a tool, would improve the quality of education in North Cyprus; those specifically relate to areas such as science and maths (Isman et al., 2007). North Cyprus is a developing country where ICT is less frequently used in the secondary schools. Similar to other developing countries, North Cyprus is experiencing problems related to technology readiness and integration of technology. A question remains as to whether these problems can be seen simply as a development lag with all the same issues that developing countries have experienced or whether differences in specific local cultural contexts and technological advancement mean that a different set of problems and strategies for dealing with them are arising. To address this problem, the Cypriot government aims to extend the use of ICTs into schools to raise standards in teaching and thus provide students with high quality education.

Statement of the Problem

The role of ICT widely considered as a core element in the education of students. Countries all over the world have identified the significant role of Information and Communication Technology (ICT) in improving education and they have invested heavily in increasing the number of computers in schools and in the networking of classrooms (Pelgrum, 2001). Furthermore, many researchers have predicted that the importance of educational technology in the classroom will continue to increase (Becker & Ravitz, 2001).

Become familiar with a range of technological tools and develop the necessary skills in using these within everyday learning environment are required from students within the [England] National Curriculum. The UK Government has invested £5 billion in schools' ICT since 1997. As a result, in the European Union with one computer for every three students, the UK has the highest levels of embedded ICT in classrooms (DCSF, 2008). Furthermore, educational technologies have been in use in the UK for more than two decades. As a developed country, the British government has already extended its use of ICT over many years. Despite substantial investments in ICT, there is little data about how schools are using computers and other ICTs. Ehrmann (1999) states that administrators tend to make large investments of time and money in ICT without sufficient data regarding 'problems, solutions and achievements' associated with ICT interventions.

This problem of lack of information on ICT usage in education is not isolated in developed countries. It is more severe in least developing countries where most education data are unreliable. In these countries, data collected are generally centred on inputs such as teachers, students, classroom and expenditure (Puryear, 1995). Researchers tend to ignore substantive issues regarding ICT implementation and its effect on people and work process (Montealegre, 1999). This finding is supported by Buchmann and Hannum (2001) who noted that there is a lack of qualitative educational research in developing countries. Fuller (cited in Buchmann and Hannum, 2001) presented that while researchers in Europe have explored factors that affect learning such as the use of ICT, developing countries have not yet charted similar research avenues.

In view of the problems identified above, this research study will investigate the problem of lack of documentation regarding the extent of ICT usage in Turkish Cypriot secondary schools. Also, this research will investigate how selected secondary schools' teachers use of ICT and which pedagogical approaches are being employed by these teachers to identify good practice of use of ICT in teaching with appropriate pedagogy. There are many researches about British schools' use of ICT whereas the extent to which Turkish Cypriot schools are using ICT is largely unknown. Without data of this kind, there is little basis for policy

formulation in the education sector. As a result, ICT equipment in North Cyprus tends to be purchased without proper terms of reference and is distributed indiscriminately.

METHOD

Research Question

The main research question for the tudy is:

'How and why are technologies being used in the classroom by teachers to enhance secondary school students' learning in England and North Cyprus?'

Sub-questions:

1. What technologies are being used by secondary school teachers?
2. What are the teacher's pedagogical beliefs?
3. What pedagogical practices are adopted in the school and how is ICT used in them?
4. Why are these technologies being used (integrated)?
5. What are the perceived barriers to and enablers for technology use and what reasons do teachers give for these perceptions?
6. How do secondary school teachers believe ICT impacts on their teaching and their students' learning?
7. Are there any differences between Cypriot teachers and British teachers in terms of the six preceding questions?
8. What can Cypriot teachers learn from the experience of teachers in England and vice versa?

Population and Sample

The population of the study consists of two England and two North Cyprus secondary schools. The sample of teachers was drawn from these secondary schools. 167 teachers from four secondary schools participated in this study's questionnaire. The number of questionnaires returned was 121. A cross sectional sample of 14 people were selected for interview. Of these 12 were teaching staff, whose competence (self-rated) level was high, medium and low and who indicated in the questionnaire that they would be happy to participate in the interview process were selected to participate, and 2 were ICT co-ordinators.

The study sample in the third phase of this research utilising Modified Delphi Method will be comprised all 12 teachers in the first round and 6 (3 pairs) teachers in the second round to discuss and revision provided lesson plans to produce ideal lesson plan which enhance students learning. This phase will be held in the beginning of June.

Procedure

This PhD study is actually based on an interpretive approach as it aims to build consensus by using the 'Modified Delphi Technique' at the end of the research. The research is a mainly a qualitative but also included the use of a questionnaire with quantitative responses.

In the first phase of this study, a survey based approach was adopted to establish the nature of the IT resources available to teachers, its location/accessibility, and state of repair, as well as the availability of technical support, the teachers' use of ICT and the training of staff in the school. The results of the questionnaire demonstrated the 'broad picture' within each of the schools in the two countries, explain and justify the selection of schools and the selection for the interviews of teachers who had the confidence and belief that they should integrate ICT more in their subject teaching, as well as teachers who were less confident.

In the qualitative/second research phase, an interview technique was adopted to determine the value of the technologies that were being used; how and why these technologies were being used/employed; which pedagogical approaches were being applied by teachers related to technology use; the teachers' acceptance of

technology use, the teachers' perceptions concerning barriers and enablers to integration of technologies, and the types of professional development provided by schools for the interviewed teachers and, ICT co-ordinators. The results were compared and contrasted between the two countries. Furthermore, the result of interviews was enabled the researcher to choose good scenarios of ICT integration into teaching for the last phase of this study.

The 'Modified Delphi Technique' will be employed for eliciting teachers' opinions on good scenarios of ICT use in teaching as the aim of Modified Delphi Method is to provide a practical means of obtaining the opinions of a group. This final phase will be completed in three rounds. In the first round of the study, ideal three scenarios will be sent to all participated teachers to examine these and then each teacher will rank scenarios according to their preference. The feedback workshop from round two is designed to highlight the different requirements for making that scenario of use a working reality for each teacher's classroom, subject and level of student – they will make decisions in designing their lesson plans concerning how to use ICT in the classroom in a pedagogy-led way – they will feedback to the group what their individual concerns were and how they arrived at a plan that would work in both countries and what changes they might need to make to be able to use the ICT effectively in the way suggested. Each teacher chooses one other lesson plan which they think they might like to try with their own group commenting on why – the results are fed back to the group – at this point it is hoped consensus around what will work (in North Cyprus and the UK) and which scenarios represent good pedagogy-led practice should be emerging – further rounds may be undertaken if needed to build a clear consensus.

RESULTS

Questionnaire

The results of questionnaire were demonstrated, first, the 'broad picture' of England and North Cyprus selected schools as presented in tables and figure in the below:

The tables below show the types of ICT resources that British and Turkish Cypriot schools have in their schools.

*Table1. Distribution of ICT tools in **England and North Cyprus** schools*

ICT Tools	Availability % (n)	
	England secondary schools (n=50)	North Cyprus Secondary schools (n=71)
Computers	94.00% (47)	90.14%(64)
Overhead projector	88.00% (44)	57.74%(41)
Printers	76.00% (38)	76.05%(54)
Scanner	56.00% (28)	35.21%(25)
Electronic whiteboard	78.00%(39)	52.11%(37)
Laptop	96.00%(48)	8.45%(6)
Camera	90.00%(45)	
Video Camera	24.00%(12)	
PSPs	34.00% (17)	
Notebook	12.00%(6)	
Mobile Phone	4.00%(2)	
Voting system	16.00%(8)	
MP3 Player	12.00%(6)	
Microsoft office programs	92.00%(46)	80.28%(57)
Publisher	18.00%(9)	
Video and sound editing soft	18.00%(9)	
Educational games	46.00%(23)	
Subject specific software	26.00%(13)	

Designing software	14.00%(7)	
Simulations	26.00%(13)	
Internet	100%(50)	91.54%(65)
Real smart	12.00%(6)	
VLE	92.00%(46)	
Intranet	92.00%(46)	
E-portal	14.00%(7)	
P drive	12.00%(6)	

The results shown in Table1 indicated that the Department for Education in England had devoted their efforts to providing schools with a different types of ICT tools 'computers', 'laptops', 'overhead projector', 'printer', 'electronic whiteboard' and other ICT tools that mentioned above, which helps all teachers in the school whatever their subjects. Teachers with these tools were able to modify their teaching methods, giving them opportunities to present their lessons more effectively.

In addition, the results shown in Table1 indicated that the Northern Cyprus Minister of Education had also devoted their efforts to providing schools with a different types of ICT tools 'computers', 'overhead projector', 'printer' and 'electronic whiteboard', which helps all teachers in the school whatever their subjects. However, when these results compare with the results that obtained from English schools, it can be said that English teachers have more ICT resources than Turkish Cypriot teachers to use in their teaching. Although Turkish Cypriot teachers have less ICT resources, they with these tools were able to modify their teaching methods, giving them opportunities to present their lessons more effectively.

Second, the results of questionnaire helped the researcher to select the most appropriate and reasonable representative participants within the selected secondary schools for the interview. The selection was based on how they are confident, how much they are using ICT in their classroom, how they rate their stage of ICT use and have they had the training. Teachers whose competence level was high, medium and low were selected for the interview. The teachers were chosen as a high competence level who use computers more than 90 minutes in their teaching activities in each week, describe his/her level of ICT skills ,particularly his/her 'classroom practice', as an intermediate level, received training and whose stage of technology adoption is between 4 to 6. The teachers were chosen as a medium competence level who use computers 15-45 minutes in their teaching activities in each week, describe his/her level of ICT skills ,particularly his/her 'classroom practice', as an beginner level, received training and whose stage of technology adoption is between 3 to 4. The teachers were chosen as a low competence level who use computers less than 15 minutes in their teaching activities in each week, describe his/her level of ICT skills ,particularly his/her 'classroom practice', as an beginner level, received training and whose stage of technology adoption is between 1 to 3.

After teachers were selected for the interview process, the selected teachers were interviewed and their analyses were given below.

Interview

These findings that were presented below are the initial findings. This means they could be changed a little bit and extended.

Teachers were asked to describe their teaching styles and it was suggested to teachers that their approach to teaching in use of ICT fell into one of the three categories. The first was instruction approach (A), where students need teachers to set clear goals and boundaries, give them access to high quality structured resources and information and lots of practice on problems to achieve success, and the teachers who fell into this category use traditional teaching methods. The second was construction approach (B), where students need collaborative group activities that help them to develop critical thinking skills, be creative, take pride in their team's work and learn to work together, and the teachers who fell into this category use constructivist teaching approach methods. The third way was to apply combination of both approaches (C). These are represented in Table2.

Table2. Teachers' Preference for the three approaches to teaching statements

Approach (Vision A, B, C)	English Teachers' responses Percentage (%), Number (n=6)	Turkish Cypriot Teachers' responses Percentage (%), Number (n=6)
A-Instruction Set clear goals and boundaries Give students access to high quality of resources Give students access to high quality information lots of practice on problems to achieve success	% 0	% 33.33 (2)
B- Construction Collaborative group activities Develop critical thinking skill Be creative Take pride in their team's work and learn to work together	% 0	% 50 (3)
C-Mixed Combination of Instruction and Construction approaches	% 100 (6)	% 16.66 (1)

All English teachers responded that they employ combination of instruction and construction approach in their teaching where half of Turkish Cypriot teachers responded that they employ construction approach, thirty three of Turkish Cypriot teachers prefer to use instruction approach and only one of them prefer to apply combination of both approaches in their teaching.

However, after examining the teachers' example of use of technology in their classroom, it can be said that teachers' responses to above question, which was about their teaching approach, is not really match with the approach that they applied in reality. For example one Turkish Cypriot teacher - Teacher9-OC-CY stated that her preference is vision B that is construction approach, however when her use of ICT in teaching examined which is below

> 'I teach literature, reading a text is very important and I need to teach my students how they need to be read it. So...I brought the CD-Player into classroom to have my students listen a text from a professional speakers.'

Most Turkish Cypriot teachers still use instruction approach. After examined their example of use of ICT in their teaching, most of them use technology as a tool to help them present their teaching. However, most of teachers in England use technology as a tool to help students to understand better, increase their problem and critical thinking skills. Some British and Turkish Cypriot teachers, who apply instruction approach, use technology to present a topic in the beginning of the lessons and then, they apply construction approach to provide group work activities or discussions to increase students' understandings, problem solving and critical thinking skills.

There are factors that influence teachers' choice of teaching approaches. Turkish Cypriot teachers' culture and school have influence their preference. Conversely, British teachers' personal preference is the factor that influences their choice of teaching approach and they give reason why they use it.

Teachers were also asked why they use technology in their teaching. Most of Turkish Cypriot teachers stated that the reasons (enhance students learning) to use technology in teaching are engage students, increase their interest on lessons, improve their understanding for better learning and make learning more enjoyable. However, British teachers use technology in their teaching to improve students critical and problem solving skills as well as help them understand subject better and engage students and take their attention.

Teachers were also asked if they see any problem in using technologies in their classroom to find out the barriers and enablers to teachers' use of ICT in teaching. The issues of lack of accessibility of ICT resources and technical support in English schools were the areas that the most of teachers pointed out where lack of available training, resources and technical support and lack of good quality of ICT resources were the areas that the most of Turkish Cypriot teachers pointed out. In terms of enablers, availability of training, technical support and resources were the most pointed out areas by British teachers while Turkish Cypriot teachers pointed out access to own personal laptop and have a skill to use technology were enable them to use technology.

Almost all British teachers received training from their schools or trainings that were provided by government. However, none of Turkish Cypriot teachers received any training on technology use or integration.

Three teachers' use of ICT, which are good practices, were selected to present how these teachers employ ICT in their teaching in pedagogical-led way and ways of enhancing learning. One of the selected teacher's use of ICT with construction approach is as follows:

'I took an entire year group and gave them an opportunity to film a zombie movie and all I gave them was some paper and planning materials, a video camera and some fake blood and they spent whole day using technology, they created a movie, they filmed it and then they edited on computers and they came up with what they wanted to come up with which I think is vision B[construction] I did it in groups which worked very well.'

Teachers stated that it's valuable learning experiences for life skill and creative thinking skill of students. Then all these good practices are examined and they are combined to produce ideal scenario later for the Delphi component.

Conclusion

These are the part of finding as last phase of study did not carried out yet but these findings reveal that the two countries are very different in available ICT tools to them, their use of ICTs, training and support that they have received and their stage of ICT adoption/integration. As it can be seen from the findings Turkish Cypriot teachers need ICT resources and training and British teachers need more training on integration of ICT into subject teaching. Third phase of study, which will be held in the beginning of June, will provide an opportunity to Turkish Cypriot teachers to learn from British teachers experiences of ICT use or vice versa through email and Skype communication software to discuss provided ideal pedagogical scenarios/(lesson plans).

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TECHNOLOGY IN EDUCATION

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Abstract

As the availability of technology has tremendously increased over the past few years, so it is the best way to utilize it efficiently in education. But due to this increasing availability of technology some questions arise in mind: if all the material can be provided to the students out of a typical class room then should they attend classes anymore? How can a teacher give his students best motivation with this increasing availability of technology, and has the role of an instructor changed? We have tried to address some of these issues in this paper and let the instructor think of a new way to improve their class room learning using some technology tools.

1. Introduction

For a long time teachers and the text book were the main source of information for the students and the material available to the students was class notes and text books, while lectures were also given by traditional use of black board and chalk.

When the overhead projectors were introduced the faculty started bringing prepared materials into the class rooms in the digital format. This data in the digital format can be made easily available to the students through the internet (Internet is no long a luxury now and is assumed as a freely available technology). But if all the materials are available to the students out –of – the class room then a problem arises that the students may start skipping the classes as why should they attend the classes if all the stuff is available out-of- the class. This leads to have some effective evaluation criteria for the students. So how can we evaluate the students effectively by the use of technology tools, and how can we help the students to enhance their classroom learning are some of the questions that we would like to answer in this paper

1.1 What are the problems of learning in classrooms?

Joseph D. Novak stated that "Education has the Five elements: Learner, Teacher, Knowledge, Context and Evaluation. The central purpose of education is to empower learners to take charge of their own meaning making" (reference). There are two types of learning in classrooms: active learning and passive learning. Passive learning is defined as that type of learning in which it is assumed that the students will enter the course which they want to study with open minds, which are like empty vessels or sponges, and the teachers will merely fill the minds of the students with knowledge, simply for the sake of securing better results in the examination and at the end of each of the sessions, the students usually remember only about ten per cent of the content which was taught during the class session. The lecturer in passive learning is basically a verbal textbook.

Active learning refers to techniques where students do more than simply listen to a lecture. Students are doing something including discovering, processing, and applying information. In active learning a student also generates rather than only receiving knowledge.

2. Mobile Learning

Mobile learning is the provision of education and training on PDAs (Personal Digital Assistants). Smart phones and mobile phones, including palmtops, handhelds, iPods and MP3 players can also be used for this purpose.

2.1 Class Room Response System

A classroom response system is a set of software/hardware mobile learning platform that facilitates teaching activities in which a teacher poses a multiple-choice question to his or her students and each student submits an answer to the question using a mobile phone or a clicker. A Software on the instructors computer collects the answers and produces a bar chart the teacher can makes “on the fly” instructional choices based on the class response

2.1.1 Using Mobile Phones as a Class Room Response System

In this system, every student has a mobile phone to answer the question asked by the instructor using SMS. It is a low cost solution (One can purchase a mobile phone for less than ten dollars. However it is not useful in those countries where the cost of an SMS is too high. (Not one paisa like Pakistan!!!)

Figure1. Students attempting a quiz using mobile phone

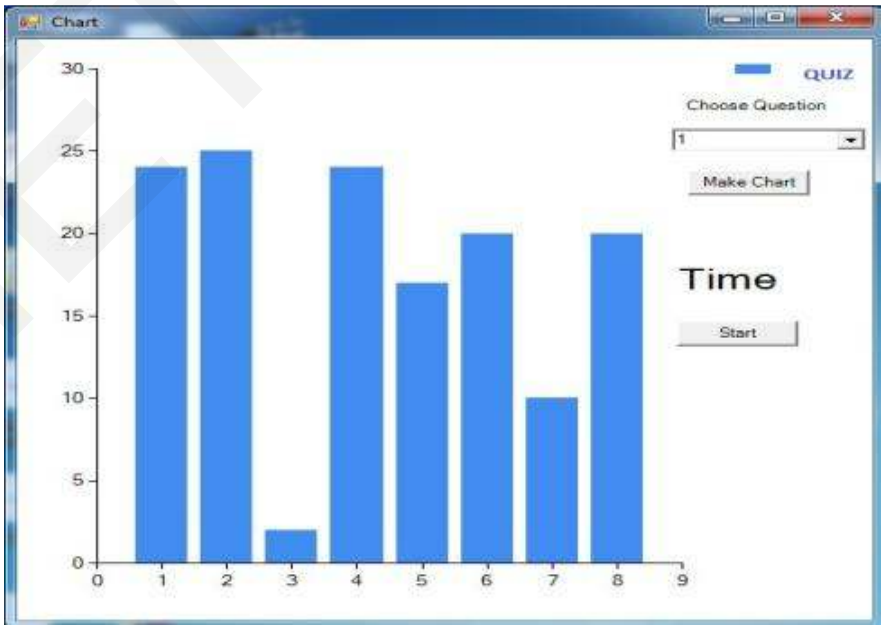

Figure 2. Bar chart showing the results of the quiz

2.1.2 Using Clickers as a Class Room Response System

Clicker is a handheld transmitter that beams a radio-frequency signal to a receiver attached to the teacher's computer. Its onetime cost is higher than the mobile phone, about 30 dollars per clicker + about 150 dollars for receiver (just one required for the class). But it does not have any issue like per sms cost.

Figure 3. Students using clickers in a classroom

3. Web 2.0- the new wave of Innovation in Teaching and Learning

Web 2.0 refers to a supposed second generation of Internet-based services such as social networking sites, wikis, communication tools etc. that emphasize online collaboration and sharing among users. All of these features are needed because of the need for community collaboration, collective intelligence, collaborative, self directed students and technology accelerators in new concept of school 2.0

3.1 Wiki

A wiki is a type of Web site that allows the visitors themselves to easily add, remove, and otherwise edit and change some available content, sometimes without the need for registration. This ease of interaction and operation makes a wiki an effective tool for collaborative learning. The term wiki also can refer to the collaborative software itself (wiki engine) that facilitates the operation of such a Web site, or to certain specific wiki sites, such as Wikipedia.

3.2 Blogs

A blog is a website where entries are made in journal style and displayed in a hierarchical order.

Blogs often provide commentary or news on a particular subject, such as food, politics, or local news; some function as more personal online diaries. A typical blog combines text, images, and links to other blogs, web pages, and other media related to its topic. Most blogs are primarily textual although some focus on photographs videos or audio and are part of a wider network of social media. The most important advantage of the blogs is that they have freely available plug-in and don't have any backward compatibility issue

Using these features of a blog we would provide a platform (http://www.lumstech.info) on which an instructor would have the following facilities:

- He can upload his lecture of different subjects in digital format with the concept maps of each lecture.

- In each lecture the student can identify the parts of the lecture (time wise and topic wise) in which they faces problems in his understanding and later on the instructor can improve his teaching by observing the graph of the student's responses.
- The instructor would have the capability to filter the responses and comments of the students in the area where most of the students are facing problems.
- He can integrate randomly generated quizzes using some freely available software like question writer, with the lectures that a student has to attempt after viewing a lecture and the result of the student would be automatically emailed to the instructor.

Figure 4. Screenshot for www.lumstech.info

4. Conclusions

In this paper we explored how technology can be used as an accelerator to enhance learning of students in classrooms and developed a low cost learning portal on which the student would be able to enjoy all the features of a course management system.

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TECHNOLOGY INTEGRATED LANGUAGE LEARNING STRATEGIES: LEARNERS OF ENGLISH

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ABSTRACT

Technology Integrated Language Learning (TILL) has become undeniable component of education both for learners and teachers in learning process. Although there are considerable studies in the field of Language Learning strategies and Technology Integrated Language Learning, the use of learning strategies in Technology Integrated environment is a new research space. Learners are involved in a technology integrated learning process through problem solving and evaluation procedures by analyzing the new material as well as activating prior knowledge and experience. Through cognitive and behavioral activities, learners can comprehend based on individuals' cognitive styles, strategy use and preferences. The learning process refers to habits involving processing, receiving, retaining, and analyzing information.

The use of strategies in language learning through technology, as a new phenomena, which is the research interest of this study, will be reflected under a literature review, and will bring discussions in strategy use. Drawing the attention to the use of technology integrated learning, this study therefore will lead to an investigation for a source/data -TILLS research tool- under the light of field experts' views and relevant literature for item development. An in-depth interview, and relevant strategy scales will be discussed critically considering Turkish learners, and a model to construct and develop an instrument TILLS will be illustrated. This study also contributed to identify and analyze domains of strategy use in technology integrated language learning environment.

ÖZET

Teknoloji desteğiyle dil öğrenme, öğrenci için ve öğrenme süreçlerinde eğitimin kaçınılmaz bir bileşeni olarak yer almaktadır. Dil öğrenme stratejileri ile ilgili önemli sayıda alan çalışması olmasına rağmen, teknoloji desteğiyle dil öğrenme, alanda henüz yeni araştırmalar olarak yer bulmaktadır. Öğrenci teknoloji desteğiyle dil öğrenirken, problem çözme, teknoloji yoluyla sunulan malzemeyi değerlendirme, deneyim ve varolan bilgilerinin üzerine yapılandırarak öğrenme sürecinde aktif rol oynamaktadır. Davranış ve Bilişsel etkinliklerde, öğrenci biliş tarzı, kullandığı stratejiler ve tercihleri ile kavramayı gerçekleştirir. Öğrenme süreci, sürecin içerisinde öğrencinin bilgiyi anlaması, akılda saklama, ve bilginin analizi gibi öğrenme alışkanlıklarını ifade eder.

Teknoloji desteğiyle dil öğrenmede kullanılan stratejiler bu araştırmanın konusu olarak, alanyazındaki tartışmaları ortaya getirecektir. Bu çalışma, Teknoloji desteğiyle dil öğrenme sürecinde Türk öğrencilerin kullandıkları stratejileri ortaya çıkararak, bir sonraki adım olan, alana bir ölçme aracı kazandıracak tartışmayı planlamaktadır. Türk öğrencilerle yapılan görüşmeler sonunda toplanan maddeler, ölçme aracının oluşturulmasına olanak sağlayacaktır. Çalışma aynı zamanda, teknoloji yoluyla kullanılan strtejileri ve maddelerin kategorilerini belirlemede katkı sağlamaktadır.

INTRODUCTION

Due to Technological Revolution, beginning in the second half of the 20th century, knowledge and practices have beeen accelarated gradually. The transformations of technology have attracted the attention of organisations and academic institutions. The challenges have brought about exciting opportunities in educational arena; re/shaped people's perceptions, habits, routines and the ways of learning and teaching. As a revolution, along with its popularity and effects in the mainstream of education, pedagogical and instructional matters related to technology have still been debatable issues. While theoretical explanations are strongly needed on the one side, its extensive use and benefits in education seem to bring innovations, networks and social platforms in instruction. Being a heavy investment for a stimulating learning environment in education, potential initiators in teaching and learning, technology has entered our lives, predominantly in education, by allowing individuals to choose their own learning styles, to learn at their own pace, considering their preferences in an enormous amount of memory storage.

As to theoretical point of view, many theories from different disciplines have contributed to conceptualization of the use of technology in education; such as second language acquisiton theory, foreign language teaching theories, language theories, and social constructivism as a learning theory, cognitive science, autonomous learning and blended learning models, etc… The theories are underlying the assumptions and beliefs about language learning, and use of technology as a purposeful and constructive knowledge building tool for a meaningful learning environment through context and pedagogical base. This paper supports meaningful language learning models, and proposes knowledge building based on learners' prior knowledge in a constructive way. Learning is a personal meaning making process, allowing learners to construct their own knowledge. Different from traditional face to face learning environment, instead of using traditional tools and delivery of lesson, individual differences in class, being unique bodies in their own way of meaning making learning process, learners construct their own knowledge based on their previous experience and knowledge.

One of purposes of this study is to discuss the effectiveness of technology in language learning process. A body of literature review about current practices of technology integrated language learning and language learning strategy use were considered. Existing literature on the use of technology integrated language learning strategies is somehow very limited in terms of empirical and systematic studies at different levels of instruction where English has been taught as a foreign language (EFL). Only limited number of studies have shown contributions of technology into language learning process. While some studies indicate the positive contribution of technology, others have claimed the lack of contribution of technology (Butler & Mautz, 1996; Clark, 1983; Kozma, 1991 in Debevec, Yau Shih and Kashyap, 2006). Integration of technology into learning has been studied and reflected as follows; technoloy as a facilitator by Mayer (2003), knowledge transfer over electronic channels by Rosenberg (2001), knowledge as special form of communication by Qvortrup (2006), learning effectiveness and satisfaction by Joy and Garcia (2000), relationship between gender and learning performance in the context of computer based anc and independently. Hui, Hu, Clark, Tam and Milton (2007) proposed the contribution of technology for high acquisition of vocabulary and grammatical skills in language learning through "technology assissted learning" (p. 249), Ahorony (2006) studied the use of deep and learning strategies among EFL learners in Internet environment, Harris, Mishra and Koehler (2009) analysed approaches to technology integration in teaching, and recommended "using the technology, pedagogy and content knowledge (TPACK) framework as a way to think about effective technology integration (p. 393), Gupta and Bostrom (2009) proposed "Technology mediated Learning" as a term, and discussed the combinations of the learning modes (blended learning) as web based/computer based, asynchronous/synchronous, instructor-led/self-paced, individual based/team based (p. 687).

Technology integrated learning terminology, in this study, refers to the ways of learning using the electronic technology such as internet, intranet, audio and video based material use, webcasts as well as learning through computer, which means learning and using the internet and modern technology. The synonymous of technology integrated learning can be named as "e-learning" covering all the levels of educational process from managing the appropriate use of technological process to handle with the resources for "self regulated learning" (based on the definition of competence by Weinert, 2001). The use of computers, internet, on line learning, digital communication tools, social platforms, World Wide Web, online practice quizzes, Power Point, some courseware, such as DynED (in Turkey), e-learning software programs such as MOODLE, have all been used as vehicles assisting learners to learn particular language skills, content knowledge, or update-upgrade information. Multimedia-as a kind of combination of text, graphic, animation, video, music, voice, and sound effects to communicate proposed by Gaytan & Slate (2002)- has been integrated into education.

For various purposes in learning language, learners communicate using wide range of vehicles in technology, they use different language learning strategies as well as the starategies defined and listed by Oxford (1990). With the beginning and integration of computer in the process of language learning (Tschirner, 2001), learning has become beyond the limitations of classroom, board and marker. Moreover, due to modern technology, learning has transformed into student-centered platform where learners are socially negotiating meaning on a virtual environment, with their own choices, own pace and preferences.

Learning Strategy

Learning strategies are special ways of processing information that enhance comprehension, learning or retention of the information (Oxford, 1990). They are defined as specific actions, behaviors, steps, or techniques such as seeking out conversation partners, or giving oneself encouragement to tackle a difficult language task used by students to enhance their own learning (Scarcella & Oxford, 1992).

Learning strategies can enable students to become more independent, autonomous, lifelong learners (Allwright, 1990).

Language learning strategies are among the main factors that help determine how and how well our students learn a second or foreign language (Oxford, 1996). The types of language learning strategies used by different learners change according to many variables including motivation (Bedell & Oxford, 1996), gender (Politzer & McGroarty, 1985), learning style (O'Malley & Chamot, 1990), and cultural background. Some research findings (Oxford, 1994) have completely explored the effects of culture in determining strategy preferences.

Although a great deal of knowledge and findings about students' learning strategies have been studied and discussed in recent years, very little is known about their use in the new environment of today's technology. It has become an urgent research interest to discuss the strategies used when learning a language through technology. Eliciting those strategies will help us understand how students can be successful in learning a foreign language regardless of the teaching method and approach employed. The mis/match of students' own learning style, preference, the training needs will shed a light on effective strategy use as well as autonomous learning discussions. As O'Malley and Chamot, (1990) point out the importance of strategy training in the use of language learning strategies, and the link between students' learning style and strategy use by Ehrman, (1994), a framework is therefore needed to help learners find out about their language learning strategies in technological environment. That will provide students guidance and opportunities for self-monitoring, become initiators for organizing and reflecting on their own learning process where they are encouraged to be self-directed and actors as process leaders. Empowering language learners by having them develop learning strategies may help them to cope with the demands of learning atmosphere and indeed, may help them to continue to learn on their own apart from the class. Oxford (1990), O'Malley and Chamot (1990) have emphasized that effective learners use a variety of different strategies and techniques in order to solve problems that they encounter while acquiring or producing the language. They put the strategies under 3 headings as cognitive, metacognitive, and social-affective strategies.

Cognitive Strategies play an executive role and refer to directly information processing". As Weinstein and Meyer (1991 in Cornford, 2002, p. 359) state that "A cognitive learning strategy is a plan for orchestrating cognitive resources, such as attention and long-term memory to help reach a learning goal. They indicate that there are several characteristics of cognitive learning strategies including that they are goal-directed, intentionally invoked, effortful and are not universally applicable, but situation specific". They are *repetition, elaboration, organizational, problem solving, resourcing translation, contextualisation, grouping, imagery, note taking, key word, inferencing, transfer, deduction, and recombination strategies*

Metacognitive Strategies refer to the regulation of learning process and are "higher order executive skills that may entail planning for, monitoring, or evaluating the success of a learning activity" (O'Malley & Chamot, 1990, p. 44). These are *organising, selective attention, planning, directed attention, self management, advance preparation, self monitoring, self evaluation,*

Social-Affective strategies refer to the maintenance of learning process, coping with success and failure. They assist learners in learning, interactive communicative skills (Mendelsohn & Rubin, 1995) and motivation. These are *self-talk, self reinforcement, self activation, cooperation, peer work-pair work, questioning for clarification.*

In this study, the need to know about why the learners tend to use technological devices will provide us how to make language learning faster, effective and easier. Learners, as learning through the use of technological devices, have different learning preferences and strategies. This study reported here explores the characteristics and the relationship between the use of learning strategies, and the use of technology in instructional context. The specific objectives are:

1. To describe the characteristics that can facilitate students' technology integrated language learning strategies,
2. To discuss the factors of language learning strategies in technology based learning process.

METHODS

In order to collect the strategies used by Turkish language learners, qualitative data was collected through interviews, field notes, expert opinions, open ended questionnaire. 76 items were elicited from the learners. Qualitative data collected in Turkish (see Attachment 1 to see item examples) was recorded and items collected were categorised in English (see Attachment 2) saving strategy names–as proposed by O"Malley and Chamot (1990). Open-ended questionnaire-asking about technology integrated

strategies used by language learners as they learn language- was conducted by the researcher and an ELT researcher in Turkish. 400 TEFL learners were selected randomly among the students studying at various levels of English as a foreign language at MEB schools. Students who are volunteer to answer the questions and ready for interviews were negotiated on the strategies while learning language through technology. The technological sources, platforms, frequencies/preferences of technology use, the skills they are applying, the needs for technoloy support, etc… were collected.

This study will lead a new research as well as develop a research Inventory-Technology Integrated Language Learning Strategy Inventory. The Inventory aims to find out language learners strategies-specifically and culturally specific to-Turkish students. Cultural background, as Deneme (2008) mentions in her research is "one of the factors that might influence strategy choice" (p. 84). 65 most frequently used www sites (see attachment 3) were elicited from the learners randomly selected both from the state and private schools in Mersin. The learners could use DynED as a courseware which was integrated into National Curriculum as well. All of the studens have the technology ability/skills, and have technology access facilities.

Concerning the learning strategies by integration technology into environment, what kind of learning strategies; cognitive, metacognitive were not observed, but asked directly to learners in their own perceptions. Metacognitive strategy use was often problematic and difficult to observe and register. Social-affective strategies were observed and interviewed as part of data collection procedure. Observation was one of the important tools to elicit students' behaviour and reactions for such studies. Besides many difficulties, "one of the difficulties with researching language learning strategies is that they cannot usually be observed directly; they can only be inferred from language learner behaviour" (Griffiths, 2004, p. 11). So, strategy use was supported with interviews and questionnaires, as well as task observation for elicitation. Items collected were categorised under 3 domains defined by O'Malley, & Chamot (1985) as cognitive, metacognitive, and social-affective strategies.

CONCLUSION

Learners tend to use more technological devices than past, and eager to change their learning habits, open to more sophisticated learning atmosphere than merely learning in traditional face to face education. The learners have also expressed that they have used technology into learning process by using 4 language skills integratedly(see Attachment 3). This study proposes that;

1. Cognitive strategies: The learners operated directly on incoming information through repetitions to remember while using technological devices, used visual images, guessing from the context, completed missing parts of information in communicative learning environment etc… Problem solving was frequently used as well as recombination strategies through games and social platforms. Using key words and clues helped them understand whole passage while practicing reading texts. Imagery and , contextualization helped their vocabulary learning process more. Moreover, they applied the rules in quizzes, online activities to understand the language, deduced the meaning it in ways that enhance learning. Without pen and paper, learners behaved technology- friendly, used comfortably.

2. Metacognitive strategies: The learners used planning strategies while organising their learning both before and during-phases of the process. They were interested in monitoring a process to comprehend, and were able to complete the task. While focusing on specific aspect of a task, in four language skills, they became more aware of their strenghts and weaknesses, then either checked with their pers (DynED), or used the source they were familiar with (such as a web page, dictionary, answers supplied, etc…). These strategies were the most frequently used ones, and integrated with cognitive strategies as well as social strategies in comfortable ways.

3. Social-Affective strategies: The learners' reactions to language learning through technology integration revealed that they cooperate with peers to solve a problem such as in online games both at and outside classroom environment to pool information, check their notes, or get/give feedback on a learning activity. Moreover, they used clarification, questioning strategies for eliciting information either from their teachers or peers; needed additional explanations, used rephrasing, or examples for clarification. However, no construct related to for example; self-talk or mental redirection of thinking have been observed or elicited from the learners.

Data collected revealed that technology Integrated Language Learning may improve learners' acquisition of knowledge in which learners are allowed to conceptualise abstract knowledge and reflect on, as proposed by experiential learning model of Kolb (1984). It facilitates learners' acquisition of knowledge. Knowing about the use and frequency of strategies through technology in language learning will provide us to train the learners in enabling them to become autonomous learners.

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ATTACHMENT 1	Her zaman	Sık sık	Bazen	Nadiren	Hiçbir zaman
Internette İngilizce bilmediğim bir kelime gördüğümde anlamını yine internetteki online sözlüklerden araştırırım.					
Internette İngilizce yeni bir kelime gördüğümde anlamını cümleden çıkarmaya çalışırım.					
Sosyal paylaşım sitelerinin dil ayarını değiştirerek (facebook, twitter vs.) İngilizce olarak kullanırım.					
Sosyal paylaşım sitelerinde (facebook, twitter vs.) karşılaştığım İngilizce videoları izlerim.					
Sosyal paylaşım sitelerinde (facebook, twitter vs.) karşılaştığım İngilizce videoları paylaşırım.					
Oyun oynarken, özellikle İngilizce olanları oynamaya çalışırım.					
İnternette yabancılarla sohbet ederken kamerayı / mikrofunu açıp İngilizce konuşmayı denerim.					
İnternette yabancılarla sohbet ederken yazarak sohbet etmeyi tercih ederim.					
"Msn'de" ingilizce sohbetleri ben başlatırım.					
Internetten altyazısız İngilizce filmler / diziler izleyerek ne demek istediğini anlamaya çalışırım.					
Internetten İngilizce filmler izlerken Türkçe altyazılı izlerim.					
İzlediğim videolardaki anadili İngilizce olan kişiler gibi konuşmaya çalışırım.					
Bilgisayarımdaki "Word, not defteri" gibi yazma programlarında İngilizce günlük tutarım.					
Bilgisayarımda, internette sörf yaparken karşılaştığım, anlamını yeni öğrendiğim İngilizce kelimeleri bilgisayarımda bir dosyaya not ederim.					
İnternette karşılaştığım videolardaki İngilizce konuşmaları anlamadığımda hepsini tekrar dinlerim.					
İnternette karşılaştığım videolarda İngilizce konuşmaları anlamadığımda, anlamadığım yere geri dönüp sadece anlamadığım yeri tekrar dinlerim.					
İnternette karşılaştığım videolarda İngilizce konuşmaları anlamadığımda, anlamadığım yeri dondurup anlamını internetteki başka programlardan, sözlüklerden araştırırım.					
Bilgisayarımın masaüstünde, bilmediğim kelimelerin anlamına bakmak için İngilizce-Türkçe / Türkçe-İngilizce sözlük bulundururum.					
Bilmediğim kelimelerin anlamını evdeki sözlüklerden bakmaktansa internetteki online sözlüklerden bakmayı tercih ederim.					
İnternet kullanırken İngilizceyle karşılaştığımda yaşadığım duygularımı bir yere yazarım.					

Attachment 2

1. Cognitive Strategies	2. Metacognitive Strategies
Building relationships between known and new things	Planning the study organisation proposed by technology
Remembering new words by visualising	Monitoring a task comprehension
Connecting sound of a new word and an image or	Focusing on specific aspect of a task
Using picture of a word for helping to remember	Listening for key words, phrases
Remembering English sounds easily through hearing and seeing	Checking their success or failures
Remembering new words from the context	Checking their scores for feedback
Visualising new words in a sentence to remember easily	Reviewing information for comprehension
Downloading some power points during the sorf on internet	Self monitoring learning content
Taking notes using the Power Point slides downloaded	Repeating the names, objects to remember
Taking online quizzez- practice exams for checking knowledge of structure	Selecting their own learning material
Completing tasks independently, no need to be supported	Selecting their own learning context
Verbalising signals help learners remembering things	**3. Social-Affective strategies**
Repeating the sounds as long as they wish	Working with peers-friends, classmate to solve a problem-complete a task
Knowing their weaknesses	Clarifying information from their peers-teachers
	Motivating learning

Attachment 3

Facebook, Play hah, Google çevir, My story maker, Online kitaplar, Mingoville, Club penguin, Xl sitesi, Twitter, Zargan, Oyun skor, Bubble struggle 2, Wikipedia, Sesli sözlük, Hotmail, msn, Knight online, Assasın'sgreed brotherhood, Punescafe, Hobbo, Moparscape, Bendes, Onlinesoccer games, Didi games, Youtube, Dailymotion, Google maps, Google images, ikariam.net, google videos, esl games, online tests, online exercises, g mail, fifa, call of duty, counterstrike, videotube, vikipedi, blogspot, flonga.com, wolfteam, ıt girl, sims,g oogle earth, google maps, wwe, S4league, Allads, Free realms, Team fortress 2, Sanalika, DarkorbitGtasan andreas? Arcadeprehacks.com, Silroad, onlineTwister, Multi theft tr., forum,Yoville Hidden object, Ttnet vitamin, Netcarshow, Skype, Playchess, Friv.com

LİSELERDEKİ ÖĞRENME ORTAMI PROFİLLERİNİN BELİRLENMESİ: BİR KÜME ANALİZİ ÇALIŞMASI

A Cluster Analysis Study of Profiling Learning Environments in High Schools

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ABSTRACT

Profiles of learning environments in Turkish high schools were investigated by means of hierarchical cluster analysis. Employing stratified random sampling procedure, data was collected from 900 students in 6 general, 13 Anatolian and 3 vocational high schools located across 12 different districts of Istanbul. In order to assess high school students' perceptions of their learning environments TROFLEI (Technology-Rich Outcome Focused Learning Environment Inventory) was administered. According to hierarchical cluster analysis, students' perceptions were clustered and categorized into 4 school learning environment profiles, namely "technology-rich & ideal", "positive", "moderately positive" and "negative" learning environments. It was revealed that 42.7% of general high school students and 53.1% of vocational high school students perceived "moderately positive learning environment" in their schools on the first rank, whereas 41.8% of Anatolian high school students mostly perceived "positive learning environment". "Technology-rich & ideal" environment was ranked first among vocational high school students with 11.2 %.

GİRİŞ

Farklı bireyler bulundukları aynı ortamı farklı algılayabilirler. Bu durum bize insan davranışlarının bulunulan ortama göre değerlendirilmesi gerektiğini gösterir. Öğrencilerin öğrenme ortamları hakkında geçerli karar verebileceklerinin öne sürülmesi, günümüz öğrenme ortamları araştırmalarının bir çoğunun temel fikridir (MacLeod ve Fraser, 2009). Öğrenme ortamlarının gerek öğrenci gerekse öğretmenlerin algı ve tutumları doğrultusunda değerlendirilmesi öğrenme ortamlarının istenilen düzeye gelebilmesi için yol gösterici olacaktır.

Sınıf öğrenme ortamları kavramı, eğitim ortamına hâkim olan iklimi, formu, havayı ve atmosferi ifade eder (Aldridge, Dorman ve Fraser, 2004). Telli ve Çakıroğlu (2002) aynı kavramı öğrenci-öğretmen etkileşimlerinin gerçekleştiği ve öğretim programlarının uygulandığı ortamlar olarak ifade etmişlerdir. Öğrenme ortamları öğrenmenin belirleyici öğelerinden biridir. Çalışmalar sınıftaki öğrenme ortamı değişkenleri ile öğrencilerin bilişsel ve duyuşsal öğrenme ürünleri arasında kuvvetli bağlar bulunduğunu ve öğrencilerin sınıf öğrenme ortamı ile ilgili algılarının onların öğrenmelerini etkilediği göstermiştir (Fraser ve Fisher, 1982, Fraser ve diğerleri, 1987; Fraser ve Butts 1982; Fraser ve Fisher, 1983; Talton ve Simpson 1987'den akt. Telli ve Çakıroğlu, 2002; Köse ve Küçükoğlu, 2009).

Öte yandan aynı sınıfta olmalarına rağmen öğrenciler farklı öğrenme ortamı algısına sahip olabilmektedir (Fraser, Rennie & Tobin, 1995). Bu durumun ortaya çıkmasında öğretmenlerin birbirinden farklı yaklaşımları ve bu yaklaşımların öğrenciler tarafından aynı şekilde algılanmaması etkili olabilmektedir. Glower ve Law (2005)'ın araştırması okuldaki örgüt kültürünün de öğrencilerin öğrenme ortamı algısını etkileyebildiğini ortaya koymuştur. Mann (2005), okullarda algılanan öğrenme ortamının doğru öğretmen bileşenlerden daha çok doğru iletişim becerisine bağlı olduğunu vurgulayarak, öğretmenlerin iletişim becerisinin öğrenme ortamı algısı üzerindeki etkisine dikkat çekmiştir.

Davranışın duruma özgü oluşu fikrinden yola çıkarak, günümüzdeki araştırmalar insan davranışlarını ortamdan izole etmekten ziyade bu davranışları içinde bulunduğu ortamda araştırır. Lewin, davranışın (B) kişi (P) ve çevre (E) arasındaki etkileşimin bir sonucu olduğunu öne sürmüş ve bu kavramı matematiksel olarak B = f (P, E) şeklinde ifade etmiştir (MacLeod ve Fraser; 2009). Öğrencilere uygulanacak öğrenme yaklaşımının belirlenebilmesi için öğrenme ortamının tanımlanması ve niteliklerinin ortaya konması önemlidir (Köse ve Küçükoğlu, 2009). Öğretim ancak öğrenme ortamları değerlendirilirse geliştirilebilir. Linden ve Erkens (2000)'e göre öğrenme ortamlarını farklı kılan 6 boyut vardır: (1) bilginin yapılandırılmasına karşın bilginin aktarılması, (2) tüm ödev-görev durumlarına karşın parça ödev-görev durumları, (3) kişisel anlam yerine öğretmenin yönlendirdiği anlam, (4) profesyonel veya bilimsel durumlara karşın resmi durumlar, (5) işbirliği ve iletişim'e karşın bireysel öğrenme, (6) öğrenme atmosferinin geliştirilmesi (akt. Efe ve diğ., 2007).

Bireylerin öğrenme ortamı algılarını ölçmek amacıyla birçok ölçme aracı geliştirilmiştir. Araştırmalarda kullanılan ölçme araçlarının hedef kitleleri, içerikleri, bilgi toplama yolları arasında farlılıklar bulunsa da, temelde hepsi öğrenme ortamındaki zihinsel süreçlerin, davranış biçimlerinin ve sosyal ilişkilerin öğrencilerin öğrenebilme aktiviteleri üzerine etkilerine yoğunlaşmıştır (Köse ve Küçükoğlu, 2009). Farklı amaçlara yönelik geliştirilen öğrenme ortamları ölçekleri arasında WIHIC (What is Happening in This Class) (Fraser, Fisher ve McRobbie, 1996), Öğrenme Ortamı Tanıma Anketi (Fraser, Anderson ve Walberg, 1982), Sınıf Ortamı Ölçeği (Fisher ve Fraser, 1983), Öğrenme Ortamı Envanteri - LEI (Learning Environment Inventory) (Walberg, 1979), Öğretmen Etkileşimi Anketi - QTI (Questionnaire on Teacher Interaction; Wubbels, Levy, 1993) ve TROFLEI (Technology-Rich Outcomes-Focused Learning Environment Inventory) (Aldridge, Dorman ve Fraser; 2004) sayılabilir.

Bu çalışmada TROFLEI ölçeği kullanılmıştır. Teknoloji-Donanımlı ve Kazanım-Odaklı Öğrenme Ortamı Envanteri (TROFLEI) Barry J.Fraser ve Jill M.Aldridge tarafından 2003 yılında Avustralya'da geliştirilmiş ve doğrulayıcı faktör analizi çerçevesi içerisinde Çoklu-Özellik Çoklu-Yöntem metodu ile geçerliliği sağlanmıştır. TROFLEI 10 alt ölçek içerir ve toplam 80 maddeden oluşur. TROFLEI'nin alt ölçekleri şınlardır: (1) Öğrenciler Arası Uyum, (2) Öğretmen Desteği, (3) Katılım, (4) Araştırma, (5) Görev Bilinci, (6) İşbirliği, (7) Sınıf içi Demokrasi ve Eşitlik, (8) Farklılaşma, (9) Bilgisayar Kullanımı, (10) Ergen Kültürü. Bu ölçeğin tercih edilme nedenlerinden biri TROFLEI'nin amaca uygun olan boyutları birleştirmiş olması nedeniyle, diğer öğrenme ortamı araçlarına göre, fen öğrenme ortamlarının birçok alanını geniş kapsamlı olarak göstermesi; diğeri ise TROFLEI'nin öğrenme ortamı araştırmalarında çok yaygın şekilde kullanılması ve birçok ülkede ve dilde geçerlik çalışması yapılmış olmasıdır.

YÖNTEM

Araştırma, tarama modeline dayanan betimsel araştırma desenine uygun olarak belirlenmiştir. Var olan bir durumu olduğu şekliyle ortaya koymayı amaçlayan bu araştırma deseninde (Karasar, 2006), İstanbul'daki ortaöğretim kurumlarında okumakta olan öğrencilerin öğrenme ortamı algıları incelenmiştir. Araştırma evrenini, 2010-2011 eğitim-öğretim yılında İstanbul ilindeki genel liseler, anadolu liseleri ve meslek-teknik okullarda eğitim gören 326,346 ortaöğretim öğrencisi oluşturmaktadır (istanbul.meb.gov.tr). Bu evrene dair sağlıklı sonuçlara ulaşmak için örneklem ilçelere göre tabakalandırılarak, öğrenciler bu tabakalardan basit tesadüfi örnekleme yapılarak seçilmiştir. İstanbul'un 12 ilçesinde yer alan 6'sı genel lise, 13'ü anadolu lisesi ve 3 tanesi mesleki-teknik eğitim veren lisede okumakta olan 985 ortaöğretim öğrencisinin verileri örnekleme alınmıştır.

Örneklem dahilindeki 985 öğrencinin 446'sını (% 45.3) erkek, 539'unu (% 54.7) kız öğrenciler; 190'nı (% 19.3) 9. sınıf, 352'sini (% 35.7) 10. sınıf, 217'sini (% 22.0) 11. sınıf, 226'sını (%23) 12. sınıf öğrencileri; 702'sini (% 71.3) sayısal alanda, 69'unu (% 7.0) sözel alanda, 132'sini (% 13.4) eşit ağırlıklı alanda, 10'unu (% 1.0) yabancı dil alanında eğitim gören veya bu alanlarda eğitim görmeyi düşünen, 72 'sini (% 7.3) ise henüz seçeceği alana karar vermemiş öğrenciler oluşturmaktadır.

Öğrencilerin sahip olduğu öğrenme ortamı algılarının ölçümünde, 10 boyutlu TROFLEI ölçeği kullanılarak, elde edilen ölçüm sonuçlarının normal dağılım istatistiği basıklık ve çarpıklık değerleri açısından incelenmiştir. Boyutlara ait çarpıklık ve basıklık değerleri Tablo 1'de sunulmuştur.

Tablo 1. Veri Setinin Çarpıklık ve Basıklık Değerleri Tablosu

Boyutlar	N	Ortalama	Standart sapma	Çarpıklık		Basıklık	
				Değer	Standar Hata	Değer	Standart Hata
Öğrenciler Arası Uyum	985	4.214	0.640	-1.336	0.078	2.613	0.156
Öğretmen Desteği	985	3.445	0.989	-0.493	0.078	-0.334	0.156
Katılım	985	3.637	0.835	-0.484	0.078	0.015	0.156
Araştırma	985	3.705	0.800	-0.738	0.078	0.794	0.156
Görev Bilinci	985	4.038	0.733	-1.122	0.078	1.826	0.156
İşbirliği	985	3.438	0.943	-0.348	0.078	-0.299	0.156
Sınıf İçi Demokrasi ve Eşitlik	985	4.124	0.867	-1.288	0.078	1.630	0.156
Farklılaşma	985	3.125	0.935	0.094	0.078	-0.407	0.156
Bilgisayar Kullanımı	985	3.169	0.955	-0.018	0.078	-0.449	0.156
Ergen Kültürü	985	4.024	0.819	-1.208	0.078	1.815	0.156

Verilerin çarpıklık değerlerinin tüm boyutlar için +2 ile -2 aralığında, basıklık değerlerinin ise +3 ile -3 aralığında olduğu görülmüştür. Ancak örneklem büyüklüğü 985 olduğu için verilerin çarpıklık değerlerinin standart hatasına oranının yüksek olduğu belirlenmiştir. Nitekim, Tabachnick ve Fidell (2007, 80), özellikle büyük örneklem sayısında standart hata oranına göre hesaplanan z değerlerinin normal dağılım için sağlıklı sonuç vermeyeceğini belirtmiştir. Dağılımı olumsuz etkileyebilecek aşırı değerlerin tespiti için veri setine uç değer analizi yapılmıştır.Bu analizde boyutların mahalanobis uzaklık değerleri incelenerek, box-plot testleri sonucunda aşırı değer veren 85 gözlem veri setinden çıkartılmıştır. Söz konusu ön analiz sonucunda ortaya çıkan yeni çarpıklık ve basıklık değerleri Tablo 2'de sunulmuştur.

Tablo 2. Uç Değer Analizi Sonrası Çarpıklık ve Basıklık Değerleri Tablosu

Boyutlar	N	Ortalama	Standart sapma	Çarpıklık		Basıklık	
				Değer	Standar Hata	Değer	Standart Hata
Öğrenciler Arası Uyum	900	4.233	0.613	-1.141	0.082	1.473	0.163
Öğretmen Desteği	900	3.448	0.973	-0.453	0.082	-0.372	0.163
Katılım	900	3.638	0.834	-0.475	0.082	-0.074	0.163
Araştırma	900	3.717	0.788	-0.638	0.082	0.484	0.163
Görev Bilinci	900	4.060	0.696	-0.900	0.082	1.039	0.163
İşbirliği	900	3.452	0.933	-0.312	0.082	-0.350	0.163
Sınıf İçi Demokrasi ve Eşitlik	900	4.147	0.832	-1.191	0.082	1.290	0.163
Farklılaşma	900	3.244	0.863	0.119	0.082	-0.296	0.163
Bilgisayar Kullanımı	900	3.169	0.956	0.003	0.082	-0.500	0.163
Ergen Kültürü	900	4.054	0.784	-1.082	0.082	1.398	0.163

Tablo 2'deki bulgular, uç değer analizi sonrası veri setinin yeni çarpıklık ve basıklık değerlerinin daha fazla normal dağılım özelliği gösterdiği belirlenmiştir. Bu sonuçlara bağlı olarak temel analizler 900 kişiden oluşan bu veri seti ile gerçekleştirilmiştir.

Verilerin Analizi

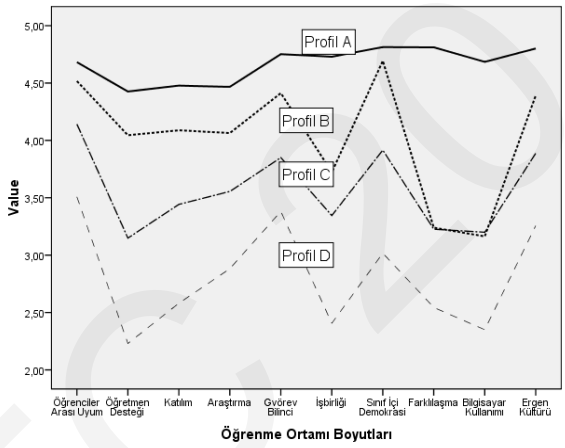
Araştırmacının, incelediği veri setinde kaç grup olduğunu başlangıçta bilmediği durumlarda, kümeleme analizi yöntemlerinden hiyerarşik kümeleme yönteminin kullanılması önerilmektedir (Çokluk,

Şekercioğlu, Büyüköztürk, 2010, 142). Öğrenme ortamı profillerinin verilerin kümeleme sonuçlarına göre oluşturulması amacıyla, kümeleme yöntemlerinden hiyerarşik kümeleme analizi seçilmiştir. Tüm boyutlara ait veriler likert tipi ölçekle toplandığı için verilerin standartizasyonu için dönüşüm uygulanmamıştır. Veriler arasındaki uzaklığın hesaplanmasına kare öklid uzaklığı esas alınarak, muhtelif kümeleme tekniklerinden "en uzak komşuluk" (furthest neighbor) ve kümeler içi kareler toplamını minimize eden Ward yöntemine ait dendogramlar incelenmiştir. Her iki dendogramda dört boyutlu küme yapısında ortaklaştığı görülmüştür (Ek-1). Küme içi varyans farkını en aza indirmesi, eşit aralıklı ölçüm sonuçlarında tercih edilen bir yöntem olması ve benzer araştırmalarda kullanılması göz önüne alınarak küme kategorileri Ward yöntemiyle belirlenmiştir (Brok, Telli, Cakiroglu, 2010; Sharman, Roorda, 2010). Her kümeye ait öğrenme ortamı boyutları arasındaki ilişkinin incelenmesinde basit korelasyon analizi ve pearson korelasyon katsayısından yararlanılmıştır.

SONUÇ

Küme analizi sonucundan ortaya çıkan 4 öğrenme ortamı profili Grafik-1'de sunulmuştur. Her bir profil, o kümede yer alan öğrencilerin okuluna ilişkin algıladığı 10 boyutlu öğrenme algısını göstermektedir.

Grafik 1: Öğrenme Ortamı Profilleri



Her profilin yatay düzlemde ayrıksı bir hat oluşturması, profillerin sahip olduğu ortalama değerlere göre isimlendirilmesini kolaylaştırmıştır. Bu nedenle, tüm boyutlarda en yüksek ortalamaya sahip ve grafikte en üstte yer alan Profil A, "teknoloji destekli ideal öğrenme ortamı" olarak; öğrenme ortamında teknoloji kullanımı dışındaki tüm boyutlarda ikinci en yüksek ortalamaya sahip Profil B, "olumlu öğrenme ortamı" olarak; bilgisayar kullanımında ikinci en yüksek ortalamaya sahip olup, diğer boyutlarda üçüncü en yüksek ortalamaya sahip Profil C, "orta düzeyde olumlu öğrenme ortamı" olarak; tüm boyutlarda en düşük ortalamaya sahip Profil D ise "olumsuz öğrenme ortamı" olarak isimlendirilmiştir. Sonuçlara göre, mevcut öğrenme ortamı açısından 61 öğrencinin okulunu (% 6.8) Profil A'da, 342 öğrencinin (% 38.0) okulunu Profil B'de gördüğü, 372 öğrencinin (% 41.3) okulunu Profil C'de ve 125 öğrencinin (% 13.9) okulunu Profil D'de gördüğü belirlenmiştir. Öğrencilerin öğretim gördüğü okul türü (genel, anadolu, mesleki-teknik) ile okuluna ilişkin algıladığı öğrenme ortamı profili arasındaki ilişkinin inecelenebilmesi için çapraz tablo oluşturulmuştur. Sonuçlar Tablo 2'de sunulmuştur.

Tablo 2: Okul Türü ve Öğrenme Ortamı Profilleri Çapraz Tablosu

Okul Türleri	Profil A		Profil B		Profil C		Profil D		Toplam	%
	N	%	N	%	N	%	N	%		
Genel Liseler	15	7.0	70	32.9	91	42.7	37	17.4	213	100.0
Anadolu Liseleri	35	5.9	246	41.8	229	38.9	79	13.4	589	100.0
Meslek-Teknik Liseler	11	11.2	26	26.5	52	53.1	9	9.2	98	100.0
Tüm Okul Türleri	61	6.8	342	38.0	372	41.3	125	13.9	900	100.0

Tablo 2'deki sonuçlar genel liselerde ve meslek-teknik liselerde öğrencilerin algıladığı öğrenme ortamının daha yüksek oranda (% 42.7 ve % 51.3) Profil C, yani orta düzeyde olumlu öğrenme ortamı olduğu; anadolu liselerinde ise öğrenciler tarafından en yüksek oranda algılanan öğrenme ortamının (% 41.8) Profil B, yani olumlu öğrenme ortamı olduğu görülmüştür. Tüm okul türleri için Profil A ile gösterilen ideal öğrenme ortamının en az algılanan öğrenme ortamı olduğu bulunmuştur. Bununla beraber görece en yüksek Profil A öğrenme ortamı algısının (% 11.2), mesleki teknik okullara ait olduğu tespit edilmiştir. Okul türü gözetmeksizin sonuçlar değerlendirildiğinde, orta düzeyde olumlu öğrenme ortamını ifade eden Profil C'nin okullarda en çok hissedilen (% 41.3) öğrenme ortamı olduğu görülmüştür.

Öğrenme ortamı profilleri, alt boyutları arasındaki ilişki açısından Ek-2'de tablolaştırılmıştır. Öğrenme profilleri öğretimde bilgisayar kullanımı açısından değerlendirildiğinde, tüm profillerde bilgisayar kullanımının araştırmaya açık bir öğrenme ortamıyla ilişkili olduğu, ya da tersi bir değerlendirmeyle araştırmaya dayanan öğrenme ortamıyla okullarda teknoloji kullanımı arasında anlamlı ilişki olduğu görülmüştür. Teknoloji kullanımı ile öğrenme ortamının işbirliğine ve farklılıklara açık olması arasında da benzer şekilde tüm profillerde ilişki tespit edilmiştir.

"Teknoloji destekli ideal öğrenme ortamı" profilindeki (Profil A) öğrencilerin öğrenme ortamının alt boyutlarına ilişkin algıları detaylı olarak incelendiğinde görülmüştür ki, ideal öğrenme ortamında: öğrenciler arasındaki uyum ile derse katılım (r=.548), derste sahip oldukları araştırma olanağı (r=.407), işbirliğine açık öğrenme ortamı (r=.454), bilgisayar kullanımı (r=.331) ve ergen kültürü (r=.303)arasında; öğretmen desteği ile araştırmaya açıklık (r=.388) arasında; katılım ile araştırmaya açık öğrenme ortamı (r=.597), görev bilinci (r=.381), işbirliği (r=.526) arasında; araştırmaya açıklık ile işbirliği (r=.646) ve bilgisayar kullanımı arasında (r=.394); görev bilinci ile işbirliği (r=.424), sınıf içi demokrasi (r=.476) ve farklılaşma (r=.453) arasında; işbirliği ile algıladığı sınıf içi demokrasi (r=.303), farklılaşma (r=.458) ve bilgisayar kullanımı (r=.517) arasında; sınıf içi demokrasi ile farklılaşma (r=.453), bilgisayar kullanımı (r=.408) ve ergen kültürü (r=.331) arasında; farklılaşma ile bilgisayar kullanımı (r=.391) ve ergen kültürü (r=.520) arasında orta kuvette ve diğer profillerden daha yüksek ilişki bulunmaktadır.

Genel olarak boyutlar arasında Profil A lehine daha kuvvetli görülen ilişki örüntüsü, sadece görev odaklı öğrenme ortamı ile ile aştırmaya açık öğrenme ortamı arasında küçük bir farkla Profil B (olumlu öğrenme ortamı) lehine; görev odaklılık ile ergen kültürü arasında ise açık bir şekilde Profil D (olumsuz öğrenme ortamı) lehine tespit edilmiştir.

Görev bilincine sahip öğrencilere daha fazla sorumluluk verilmesi ve onların yetişkin olarak görülmesi beklenen bir durumdur ancak daha olumsuz öğrenme ortamı profillerinde bu iki boyut arasında daha yüksek ilişkinin varlığı ilginç bir sonuçtur. Diğer bir değişle, kendini yetişkin olarak gören insanların öğretim sürecinde daha aktif görev bilincine sahip olması Profil D (r=.522) , Profil C (r=.254) ve B'de (r=.225) anlamlı ilişki gösterirken, Profil A'da söz konusu boyutlar arasında anlamlı ilişki tespit edilmemiştir. Nitekim Grafik 1'deki profiller incelendiğinde, tüm profillerde görev bilinci ile ergen kültürü ortalamasının birbirine çok yakın olduğu görülmektedir. Ancak, tam öğrenmenin hedeflendiği ve çoklu öğrenme kuramına göre herkesin başarılı olabileceği ve öğrenebileceği bir alanın olması gerektiğini öngören çağdaş öğretim anlayışı düşünüldüğünde, ideal öğrenme ortamında ergen kültürü ile birlikte farklılaşmaya da önem verildiği (r=.522) ve farklılaşma ile görev bilinci (r=.429) ve sınıf içi demokrasi arasında ilişki olduğu (r=.453) görülmektedir. Görev bilinci açısından ele alındığında ergen kültürünün yerini "ideal öğrenme ortamında" farklılaşma ve sınıf içi demokrasinin aldığı, bu nedenle söz konusu ilişkinin Profil A'da anlamlı çıkmadığı yorumlanmıştır.

TARTIŞMA

Brok, Telli, Çakıroğlu, Taconis ve Tekkaya(2010) biyoloji sınıf ortamlarını öğrencilerin nasıl algıladıklarını belirlemek, diğer ülkelerdeki öğrenciler ile öğrenci algılarını karşılaştırmak ve Türkiye'deki lise biyoloji sınıflarında, öğrenme ortamı profillerini ortaya çıkarmak için Bursa'daki 4

okuldaki 52 sınıfta, 1474 lise öğrencisi ve 11 biyoloji öğretmeni ile bir çalışma yapmışlardır. Küme analizleri sonucunda, 6 öğrenme ortamı profili tanımlamışlardır. Bu profiller: (a) özyenetimli öğrenme sınıfı; (b) göreve yönelmiş işbirlikli öğrenme sınıfı; (c) ana akım sınıfı; (d) göreve yönelmiş kişiselleştirilmiş sınıf; (e) düşük etkili öğrenme sınıfı; (f) yüksek etkili öğrenme sınıfı olarak adlandırılmıştır. Brok, Telli, Çakıroğlu, Taconis ve Tekkaya (2010)'nın "özyenetimli öğrenme ortamı" profili ile bu çalışmada elde edilen Profil B, "olumlu öğrenme ortamı" arasında ciddi benzerlikler olduğu görülmüştür. Söz konusu araştırmadakine benzer şekilde bu araştırmadaki olumlu öğrenme ortamı profilinde sınıf içi demokrasi algısının yüksek değerler aldığı ancak sınıf içi işbirliği değerlerinin diğer boyutlara oranla daha düşük değerler aldığı görülmüştür. Bu durum okullarda yapılan takım çalışmasının öğrenme ortamı üzerinde beklenebileceği ölçüde etkili olmadığını ve öğrencilerin sınıf içi işbirliği algısının yapılacak işbirlikli öğrenme etkinlikleri ile geliştirilebileceğini düşündürmektedir.

Gupta ve Koul (2007)'un 705 lise öğrencisi ile gerçekleştirdiği araştırmada, öğrencilerin öğrenme ortamı algısı incelenmiş ve algı boyutları arasındaki ilişkiler tablolaştırılmıştır. Araştırmanın bulguları, Hindistan'da teknoloji destekli bir öğrenme ortamının daha öne çıktığını ortaya koymuştur. Boyutlar arasındaki ilişki incelendiğinde, en yüksek ilişkinin öğrencilerin öğrenme ortamındaki işbirliği ile araştırmaya açıklık (r=.58) ve sınıf içi demokrasi (r=.59) algıları arasında oluştuğu görülmüştür. Gupta ve Koul (2007)'un araştırma sonucuyla, yürütülen araştırmanın sonuçları boyutlar arasındaki ilişkiler açısından benzerlik göstermektedir. Bulgularda görüldüğü üzere, bu araştırmanın sonucunda boyutlar arasındaki en yüksek ilişkinin, Profil A'da (teknoloji destekli ideal öğrenme ortamı) öğrencilerin işbirliği algısı ile araştırma algısı arasında oluştuğu ortaya konmuştur (r=.65). Bu sonucun, genel anlamda düşük olan işbirliği algısının nasıl yükseltilebileceği konusunda önemli bir veri sunduğu düşünülmektedir. Araştırma çalışmalarının artırılması ve sınıflarda araştırma çalışmasına uygun öğrenme ortamlarının oluşturulmasının, işbirliği algısının yükselmesinde önemli bir etken olabileceği yorumlanmıştır.

Dorman, Aldridge ve Fraser (2006)'in Avustralya'da okuyan 4,146 lise öğrencisi ile yürüttüğü araştırmada öğrencilerin öğrenme ortamı algıları incelenmiştir. Bu çalışmaya benzer şekilde kümeleme analizinin kullanıldığı araştırmada, 5 öğrenme ortamı profili oluşturulmuştur. Oluşan kümelerin, bu araştırmada ortaya konan profillerle önemli ölçüde benzerlik taşıdığı görülmüştür. Görev bilinci ve sınıf içi demokrasi boyutlarının, bu çalışmayla benzer şekilde yüksek değerler aldığı, ancak sınıflarındaki bilgisayar destekli öğrenme ortamına yönelik öğrencilerin düşük algıya sahip olduğu görülmüştür.

Diğer araştırmalardan farklı olarak, bu araştırmanın kümeleme analizinde teknoloji destekli ve ideal bir öğrenme ortamı profili (Profil A) oluşmuştur. Ancak bu algıya sahip öğrencilerin sadece % 6.8 oranında olması oldukça düşündürücüdür. Lim (1995)'in araştırması, öğrencilerin öğrenme ortamına ilişkin algılarında okul türünün en önemli etken olduğu sonucunda ulaşmıştır. Bu anlamda, mesleki ve teknik okullarda diğer okullara oranla teknoloji destekli öğrenme ortamının daha yüksek yüzdeyle görülmesinin (%11.2), bu liselerde verilen teknik eğitimle ve bazı bölümlerinin teknoloji ağırlıklı eğitim vermesiyle ilişkili olabileceği yorumlanmıştır.

Araştırma sonucunda şu önerilere gidilmiştir:

1. Genel liselerde öğrencilerin büyük oranda (% 42.7), orta düzeyde öğrenme ortamı (Profil C) algısına sahip olduğu görülmektedir. Özellikle hissedilen öğretmen desteği ve bilgisayar destekli öğretime yönelik düşük algıyı işaret eden bu durumun aşılabilmesi için öğretmenlere sınıflardaki öğrenme ortamının zenginleştirilmesi konusunda gerekli hizmet içi eğitimler verilmeli ve buna bağlı olarak okullardaki bilgisayar destekli eğitim faaliyetleri geliştirilmelidir.

2. Ortaöğretim ders programlarında araştırma yöntemleri dersine daha çok yer verilerek, sınıf içerisinde araştırmaya açık bir öğrenme ortamı teşvik edilmeli ve öğrencilerin takım çalışması ile araştırma yapmaları teşvik edilmelidir.

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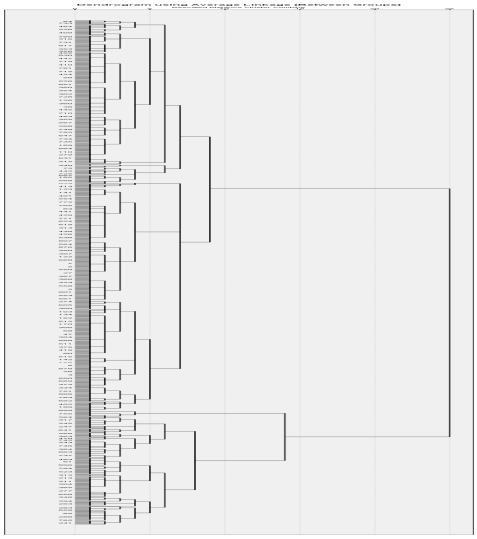
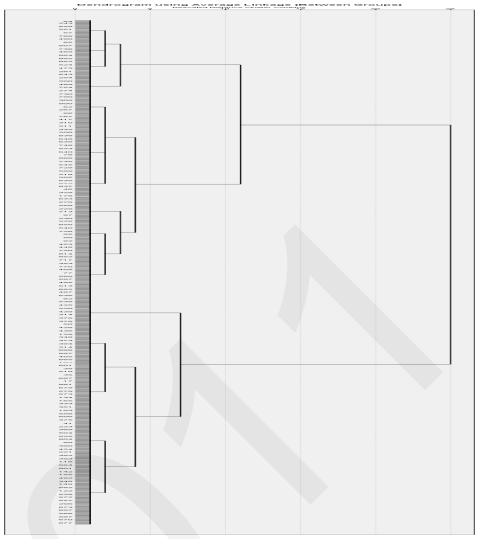
Ek 1: Kümeleme Dendogramları

En Uzak Komşuluk Yöntemi Dendogramı



Ward Yöntemi Dendogramı



Ek 2: Profillere Göre Boyutlar Arası İlişki Tablosu

Boyutlar		Öğrenciler Arası Uyum	Öğretmen Desteği	Katılım	Araştırma	Görev Bilinci	İşbirliği	Sınıf İçi Demokrasi	Farklılaşma	Bilgisayar Kullanımı	Ergen Kültürü
Öğrenciler Arası Uyum	Profil A	1,000									
	Profil B	1,000									
	Profil C	1,000									
	Profil D	1,000									
Öğretmen Desteği	Profil A	,141	1,000								
	Profil B	,110*	1,000								
	Profil C	-,046	1,000								
	Profil D	,028	1,000								
Katılım	Profil A	,538**	,255*	1,000							
	Profil B	,306**	,187**	1,000							
	Profil C	,225**	,110*	1,000							
	Profil D	,348**	,129	1,000							
Araştırma	Profil A	,407**	,388**	,597**	1,000						
	Profil B	,182**	,119*	,428**	1,000						
	Profil C	,017	-,066	,392**	1,000						
	Profil D	,132	,123	,272**	1,000						
Görev Bilinci	Profil A	,197	,272*	,381**	,508**	1,000					
	Profil B	,199**	,133*	,243**	,523**	1,000					
	Profil C	,142**	-,018	,099	,332**	1,000					
	Profil D	,098	,041	,279**	,471**	1,000					
İşbirliği	Profil A	,454**	,229	,526**	,646**	,424**	1,000				
	Profil B	,382**	,061	,175**	,232**	,117*	1,000				
	Profil C	,196**	-,165**	,186**	,172**	,069	1,000				
	Profil D	,247**	,089	,367**	,074	,152	1,000				
Sınıf İçi Demokrasi	Profil A	,198	,087	,131	,189	,476**	,303*	1,000			
	Profil B	,001	,265**	,199**	,103	,244**	-,038	1,000			
	Profil C	-,107*	-,075	-,139**	-,011	,126*	,029	1,000			
	Profil D	-,079	,192*	,009	,052	,214*	-,073	1,000			
Farklılaşma	Profil A	,245	,230	,210	,227	,429**	,458**	,453**	1,000		
	Profil B	,005	,120*	,045	,248**	,207**	-,007	-,052	1,000		
	Profil C	-,038	,012	,171**	,164**	,101	,404**	,013	1,000		
	Profil D	,071	-,024	,160	,305**	,346**	,199*	,257**	1,000		
Bilgisayar Kullanımı	Profil A	,331**	,026	,156	,394**	,207	,517**	,408**	,391**	1,000	
	Profil B	,143**	-,091	-,045	,181**	,085	,160**	-,062	,147**	1,000	
	Profil C	-,037	-,038	,139**	,277**	,078	,285**	-,015	,407**	1,000	
	Profil D	,046	,020	,106	,308**	,242**	,348**	-,079	,390**	1,000	
Ergen Kültürü	Profil A	,303*	,263*	,043	,093	,101	,201	,331**	,520**	,295*	1,000
	Profil B	,203**	,096	,209**	,192**	,225**	,013	,078	,143**	,090	1,000
	Profil C	,043	-,142**	,074	,152**	,254**	,082	,208**	,237**	,115*	1,000
	Profil D	,155	,111	,209*	,196*	,522**	,261**	,238**	,386**	,289**	1,000

THE PROFESSIONAL COMPETENCIES AND INDICATORS OF TECHNO-PEDAGOGICAL EDUCATION FOR TEACHERS*

TEKNOPEDAGOJIK ÖĞRETMEN YETERLIKLERININ VE GÖSTERGELERININ BELIRLENMESI

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ABSTRACT

The main purpose of this study is to determine the professional competencies and indicators that teachers should have for TPACK-based techno-pedagogical education. the present study was carried out with qualitative research methods. The participants of the study were 24 faculty members from the field of educational technology at 9 different universities in Turkey. An incremental structure was applied for the preparation of the data collection tool. Data included the video records, audio records, researcher diaries and documents that were collected during the workshop. Based on the findings, the main themes were gathered under six dimensions as "Designing the instructional process", "Executing the instructional process", "Being open to innovation", "Obeying ethical issues", "Problem solving" and "Specialization in the field". As a result of the present study, techno-pedagogical competencies, competencies area and indicators were determined in line with the views of the field experts.

Keywords: Technology Integration, Technological Pedagogical Content Knowledge, TPACK, Technological Education, Teacher Competencies.

* The present study is based on a part of a scientific research project supported by The Scientific and Technological Research Council of Turkey (TUBITAK) – number 109K191 – called `Effect of The Techno-Pedagogical Education on Pre-service Teacher and a Framework for Techno-Pedagogical Education`.

1. INTRODUCTION

In order to provide effective technology integration in education and minimize the barriers of technology integration, various approaches have been developed. One of these approaches is Technological Pedagogical Content Knowledge (TPCAK) framework proposed by Koehler and Mishra (2005) as a model that focuses on effective technology integration in the teaching process with respect to teacher competencies in technology use. In other words, TPACK focuses on technology integration not only with respect to the teachers` technology use knowledge, but also with respect to the interaction and combination of teachers' knowledge in the field of technology, pedagogy and content.

Since the model of TPACK is a new and up-to-date approach to effective technology integration, there are an increasing number of studies carried out based on this model. It is seen that many of these studies are generally conducted based on the quantitative approaches such as survey models to measure TPACK. Depending on this, studies related to the development of TPACK-based teacher professional competencies will contribute to TPACK literature and relevant researches. In addition, there are professional studies on the establishment of educational technology standards at international and national area. In these studies, the competencies that teachers should have with respect to their leading digital age-education were determined with NETS-T by ISTE. These studies which were conducted to determine the competencies and indicators for teachers in terms of TPACK could help train teachers to have the necessary skills and knowledge about the effective technology integration in the national and international literature.

2. METHOD

Within the scope of the present study, the teaching-learning process carrying out based on TPACK is defined as techno-pedagogical education. The main purpose of this study is to determine the professional competencies and indicators that teachers should have for TPACK-based techno-pedagogical education. Depending on this purpose, the present study was carried out with qualitative research methods. The participants of the study were 24 faculty members from the field of educational technology at 9 different universities in Turkey. An incremental structure was applied for the preparation of the data collection tool. In this process, the document was created after the creation of the conceptual framework and then the pre-workshop held with educational technology experts was used as the basic data collection tool of the study. With the participation of the 24 faculty members' expert in the field of educational technology, a workshop was held within the scope of the 3rd International Computer and Instructional Technologies Symposium on the 8th of October in 2009, in Trabzon, Turkey. Data included the video records, audio records, researcher diaries and documents that were collected during the workshop. The transcriptions of the data revealed 120 indicators regarding techno-pedagogical education. The inductive content analysis approach was taken as basic for the analysis of the indicators. The themes obtained as the result of the data analysis were called as the competency area and the sub-themes as competency. The resulting indicators were placed under the related competencies in the competency area.

3. FINDINGS

Based on the findings, the main themes were gathered under six dimensions as "Designing the instructional process", "Executing the instructional process", "Being open to innovation", "Obeying ethical issues", "Problem solving" and "Specialization in the field". There were five sub-themes under the theme of 'Designing the instructional process' determined as the competency area; two sub-themes under the theme of 'Executing the instructional process'; four sub-themes under the heading of 'Being open to renovations'; five sub-themes under the heading of 'Obeying ethical issues'; three sub-themes under the heading of 'Problem solving'; one sub-theme under the heading of 'Specialization in the field'. Thus, a total of 20 competencies were determined. A total of 120 indicator statements regarding each competency included in the competency areas were created.

4. CONCLUSIONS

As a result of the present study, techno-pedagogical competencies, competencies area and indicators were determined in line with the views of the field experts. In addition, considering the competency areas, the competencies and the indicators as a whole, a booklet called "Techno-pedagogical Educational Competencies and Indicators" was prepared. Furthermore, these competencies and indicators were used for the development of the "Techno-pedagogical Educational Competency Scale", which was the following phase of the study. In this respect, the present study constituted the basis of the "Techno-pedagogical Educational Competency Scale" developed for the purpose of determining teacher candidates' levels of techno-pedagogical educational competencies. In addition, we plan to use these proficiencies and indicators to structure and develop a course content based on the techno-pedagogical education in the next phase of the study.

TESTS IN THE EXAMINATION

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ABSTRACT: Since long years is a serious problem in Hungary the large number of students in higher education institutions, and because of that the teaching overload due to massive test corrections. All this has a bad influence to the teaching and learning processes too. In light of these raises – in order to facilitate the teaching work – the tests need to be involved in the correction process.
Many people have doubts about the application of tests, and the suitability of the result showed by them. But well-constructed tests are used effectively in many areas of life. One of the big areas is the exam for Traffic Rules to the acquisition of a driving licence what is necessary for participation in traffic. The other important area for the application of the tests is the language learning today, and the language exam.
The assessment, with the presentation of practical experience and results, tries to point the substance of test type examination with a particularly among the informatics courses.
KEYWORDS: test, informatics, examination

INTRODUCTION

Numerous options are available in the education for measuring students' knowledge both in the case of normal and electronic materials. It is often thought to be obvious that the exam is paper based if the material was printed out as well. However, it has several disadvantages, especially the unnecessary energy and paper usage which are harmful both financially and environmentally. (Dövényei-Nagy *et. al.,* 2005, p 12) Tests can be written electronically also in the case of normal paper based materials either in self-developed systems or different free softwares. Electronic materials are available in the known free LMCSs (Learning Content Management System). In this case tests are obviously taking place in the frames of the system. The opportunity of usage is preset, however these systems can be expanded with some creativity and savvy. It is typical that a time limit for answering the questions can be set and each solution can have a score.
Beyond the beloved and free *Hot Potatoes* tests which are mainly popular among language teachers, it also contains an interlace module that can form the separate questions into questionnaires. (http://www.halfbakedsoftware.com/hot_pot.php) These questionnaires should practically be exported to one of the material developer systems so that time and score can be ordered to the exercises. Examples for sentence complement, word fill in, true or false and multiple choice questions can be found in the free *eXe* (eLearning XHTML editor) open source-coded editor too. (http://www.exelearning.org) These softwares – Hot Potatoes and eXe – ensure chance for widening the functions of LCMSs and provide variety in the display. Additionally they also make electronic tests available for those who have not used LCMSs before. Fitting these questionnaires into the system can be committed to system administrators.
The above mentioned things prove that tests are not only appropriate for self-check but for examination as well.

TESTS

One unarguable advantage of the tests lies in the definite answers which make simple and quick corrections possible.
There are two different types of knowledge measuring tests: the multiple choices and the answer generating questions. *Multiple choice questions* are mainly used for measuring cognition style knowledge. These types of questions are true/false, yes or no questions, multi-select questions and joint answers as well. (Szabó-Thalmeiner, 2010) In case of informatical course these exercises can be e.g.: searching for source-code errors, checking the running results of code items or recognizing hardwares in pictures, deciding the verity of technical statements. The advantage of using multi-choice tasks, the evaluation system is developed after using the key, and it's easy to scoring assignment evaluation of the papers. However one disadvantage is that students need to go through the false answers as well so in case of faltering knowledge they may memorize the wrong answer. Furthermore in the first they give more work for the examiner, e.g.: he needs to draft believable wrong answers which are not easy at all. With *answer generating questions* not only cognition but the communication and reasoning skills can also be measured. These kinds of questions can be sentence completion, giving shorter or longer answers or essay

writing. The advantage of these exercises are easier since only the questions needed to be composed and giving possible false answers is not required. (Szabó-Thalmeiner, 2010) Students need to draw up the answers on their own. However computerized correction of the tests is more problematic since a more detailed key is required from the teacher.
In knowledge measuring norm orientated and criteria orientated evaluation need to be differentiated. In norm orientated knowledge measuring the evaluation of each student depends on the result of the others as well. In criteria orientated measuring however students need to reach a certain level to pass. (Falus I., 1993)
In higher education it has been a problem that students have different knowledge from the secondary schools. (Kiss G., 2011) However in the semesters afterwards they need to fulfill the same requirements for getting the credits of a certain subject irrespectively of the secondary school they are coming from.
In this present research only criteria orientated tests are detailed.

INFORMATICAL INFRASTRUCTURE

Hardware

Test exams have two different types: printed or electronic. Printed tests have many disadvantages however. The teacher sets the questions on his own computer, prints out at least one copy and manifolds it with a copy machine. In the beginning of the exam he gives the tests to the students and in the end he collects them. He can either correct with templates but he needs to go through each tests and given answers. Students work ends with writing the exams, but the instructor work only just began. One great advantage of printed exams is on the other hand that it does not require high informatical skills and complete system development.
For electronic examination a certain number of computers is required.
In our case – for B.Sc (and M.Sc) computer engineering students of University of Óbuda, John von Neumann Faculty of Informatics – both for seminars and examinations seminar rooms with 24 modern computers are available. The practices and exams detailed in this research were both held in these rooms.

Software

There are certain types of test and unique systems developed specifically for knowledge measurement. The learning material does not need to be electronic and in most cases it is usually printed. However exams are electronic due to the high number of students and compensation of the grown duties of teachers.
A short (2-3 sentences), essay responses is set out in this already exists in practice. The eMax intelligent knowledge assessment system makes the evaluation of short essays possible and was developed by the cooperation of University of Óbuda John von Neumann Faculty of Informatics (before 1st Jan 2010 Budapest Tech John von Neumann Faculty of Informatics) and IBM. Evaluation in this system is semi-automatic since one part of the tests needs to be corrected by the teacher. (SIMA *et al.* 2008) In this case each answers needed to be checked by the teacher one by one. However these test represent only 10-20% of the whole.
The development of this system was started in 2005 and its β version has been used since 2008. The idea of the application came from the difficulties of evaluating essay type questions. In this programme in University of Óbuda the evaluation of answers is 80-90% automatic but setting the tests is – still – not. After setting the test questions and the possible answers they are mixed by the programme. So the correct answers are not marked with the same signs for students sitting next to each other and questions are not in the same order. These individualized exams also help objectivity since this highly reduces the chance of using external help.
The background of this research is provided by eMax intelligent knowledge assessment system which has already shown its great advantages in exam situations since 2010. This system was developed specifically for evaluating short essay answers but setting and evaluating tests are also possible.

PRELIMINARIES

The focus group of this research is the results of the *Assembly Programming* trial and real exam in the 2nd semester of the academic year 2010/2011 among full time B.Sc. computer engineering students in University of Óbuda John von Neumann Faculty of Informatics.

There are 182 students in the class learning in groups of 18-24 persons. Lessons are held in the previously mentioned seminar rooms with 24 available computers. Theoretical education is held in these rooms as well. The 8 groups – due to the number of students – are divided among 4 teachers but not equably. There are max 24 students in 1 course which makes possible for the teachers to follow the students with attention.
The requirement of *Assembly programming* is to fulfill an exam in the end of the semester. The result gives the students a semester mark. This exam consists of two parts.
Part one contains tests which need to be solved electronically in closed system. Evaluation in this case is possible by one click since the parameters are set previously.
Part two is for testing the practical knowledge. Students need to finish the exercise in limited time frame, these programmes need to be able to compile and able to run and also need to have all required functions. The tests included in tasks should be implemented in the code. Not only ability to compile, ability to run and functions but its codes are important as well. In the practical part there is more than one programming exercise which are done and evaluated beyond eMax.
Based on the experiences of the previous years from the 2nd semester of the academic year 2010/2011 on students have a trial practical exam in the course as well. Its advantage is that students are facing the knowledge requirements before the end of the semester. Additional advantage that it also forced the students to learn programming not to leave to the last minute, because learning it requires a lot of time and mainly lot of practicing. However writing this trial exam is not obligatory. On the other hand it is useful to know if the personal knowledge fulfills the requirements or not. Furthermore it does not come with any disadvantages since the result is only informative and can only effect at the end of the semester grade positively.
Students write the real exam before the last lecture of the semester so that they can have another chance in the last occasion to retry it if necessary. At this point, it is possible to repeat only the unsuccessful task part of the test. The result of this exam will give the final grade. For those who do not manage to pass this way have the chance to re-do the exam one more time in the first two weeks of the examination session.

THE TESTS

First a question database needs to be set while some previously set exercises were taken out of the possible exam questions. Others were modified and also some new exercises were composed. Previously the ratio of test and essay questions was 50-50%. It was the first occasion this year that both the trial and the real exam contained tests. Test questions needed to be grouped and installed into the system in topics so that they can stay clear. This also makes possible to increase the number of questions later and helps to see which parts need to be extended.
In the first step the database also needed to be re-edited for the trial exam. It also needed to be taken into account that the semester was still not over and students still did not study about all topics. While composing the questions high attention was required not to contain any topics still not studied. Different types of questions, e.g.: true/false and multi-select questions were written in all topics. Multi-select questions are dominating in the database however.
There were altogether 15 questions in the test part of the trial exam with a time limit of 20 minutes. Answers could be sent to the server faster as well but after the time limit elapses the system automatically does so. The tests included the true/false type of questions however the majority of the test were multi-select questions. Among the multi-select questions some had 2 correct answers but some had only one. Students were informed that the number of the correct answers can be one, more or none. It also meant that questions were written both in singular and in plural, e.g.: *„Which statement(s) is/are correct about the XXX instruction(s)?”*. The other possible test type with one or more correct answers is the comparison of two things, when similarities or differences need to be found. For questions like *„Which result do we get after running the following code item?”* can be more that one correct answers given. They can either give the result in decimal or binary value but the answer can be described in words. This case the correct answer also consisted of more parts. There were 3 programming exercises in the practical part.

After the trial exam the question database needed to be extended to the whole learning material and had to take account the experience gained during the trial exam. New topics were added to database and „None are correct.” was also added to the possible answers. It was required since in some cases no correct answers were marked by the student as it was also a possible answer. This way however it could not decided if the student skipped the question or thought that the correct answer is not among the possibilities. In the real exam students marked this possible answer many times but there were still some

of them who didn't mark anything. So it is possible to judge how carefully solve students the tests and to call their attention to this problem.
There were already altogether 20 questions in the test part of the real exam with a time limit of 35 minutes. Half of the questions were given among the ones in the trial exam but they were not asked in the same courses as previously. This way one exact type of exercise was solved by higher number of students and better statistical conclusions could be drawn. The number of practical exercises was also increased from 3 to 5.

RESULTS

The rating of tests was the following. 1 point was given for each test no matter how many correct answers should have been marked. In this exam (both trial and real) 2 possible answers could give one correct answer. If only one of the correct answers was marked, the student goes 0.5 point. However marking a wrong answer meant 0 point for that question. E.g.: in a question where the number of correct answers is 2, the student marked 1 correct answer and 1 wrong answer he got 0 point. The situation is the same if he marked both correct answers but also a wrong one. So 1 or 0.5 point could have been got only if the student had confident knowledge. This way it was not possible to pass with guessing the answers.
As mentioned previously, writing the trial exam was not obligatory. However, if more than 50% was reached on the trial exam if meant +5% in the final grade if the result of the real exam was at least 60%. Despite this only 78.5%of the students (143 people) have chosen this option.

Groups	Group 1 (18 ppl)	Group 2 (14 ppl)	Group 3 (18 ppl)	Group 4 (22 ppl)	Group 5 (18 ppl)	Group 6 (15 ppl)	Group 7 (18 ppl)	Group 8 (20 ppl)	Class mean (143 ppl)
Test mean (%):	77,6	68,3	67,4	63,8	68,3	59,3	67,2	68,0	67,5
Practical mean (%)	31,4	33,1	40,9	40,3	45,9	33,0	18,3	40,2	35,4
Result (%)	54,5	50,7	54,1	52,0	57,1	46,1	42,7	54,1	**51,4**

Table 1, Results of the trial exam in groups and aggregated.

The results of the trial exam can be seen in Table 1. Students were for less successful in the practical part of the exam than in the tests. It could be stated that the theoretical tasks because of nature of being test were easier than the practical ones. To refuse this opinion a calculation has been completed which shows what correlation there is – in case of each student – between the test results and the results of the programming tests. It appears that a medium positive relationship between them can be discovered (correlation: 0.42), which shows that typically those students performed better on multi-select questions, who were better in the practical tests. Who has not been a good test of performance, they are weakly active in the programming, or, worse, it has not even written. This is why the mean of Group 7 is lower than other groups since after the bad test results student have chose not to try the practical part.
The best result in tests was 96.7%, the worst 13.3%. As about the practical part: results are more extreme since students either did the exercises or did not try them at all. The best result in this case was 100%, the worst 0%. The mean of the trial exam was 51.4%. The average result of the students participating in trial exam was 51.4%.

As it can be seen in Table 2, only 173 students out of 182 have written the real exam. The reason for it can be the dropout during the semester. If the student does not attend 30% of the seminars he is automatically blocked in the course in that semester. The missing 9 students have the chance to write the exam in the last lecture of the semester it is impossible to know for sure – yet – how many people fulfills the requirements of the semester.
Results in Table 2 do not contain the results increased with 5% since it does not affect this research, only student has benefit from it. However it can be clearly seen that the result of the real exam was better than the trial exam. It is especially exciting if we mention that the test results were worse in the real one than in the trial. The reason for the improvement is that students solved the programming exercises much better than in the trial exam.

Groups	Group 1 (22 ppl)	Group 2 (17 ppl)	Group 3 (24 ppl)	Group 4 (23 ppl)	Group 5 (23 ppl)	Group 6 (17 ppl)	Group 7 (24 ppl)	Group 8 (23 ppl)	Class mean (173 ppl)
Test mean (%):	55,0	55,1	47,5	54,2	46,4	54,6	49,7	57,4	52,5
Practical mean (%)	76,8	57,8	59,2	59,0	73,6	68,8	68,4	76,4	67,5
Result (%)	66,0	56,4	53,3	56,6	60,0	61,7	61,0	66,9	**60,0**

Table 2, Results of the real exam in groups and aggregated.

Despite these facts the performance of students is worse than expected. Despite the number of available exams only 97 students out of 182 managed to reach the limit of 60% to get the credits that is only slightly more than half of the students succeeded.

SUMMARY

Among the three basic requirements of evaluation objectivity was absolutely materialized since the correction of the tests was fully automatical according to the previously set parameters. That the scoring, and thus the assessment is carried out by the computer, the possible mistakes made by overloaded teachers can be reduced. The wording and clarity of questions has allowed the fulfillment of the objectivity on the examiners' side, as they were only present on the exams to secure the exams fair and without external help. Automatic evaluation has one more great advantage. The results almost immediately become available for trainers, and this way the students are much sooner informed of their performance.

After summing up the result of the trial exam the *„None are correct."* optional answer was also given in the real exam. Due to this change there were fewer questions without any marked answers. However it brought another problem to the surface: students even leave some questions without answers if this new optional answer was given. It either means that they were lack of time for marking any options or they were careless. It is worth examining how those students did in other questions that left some without answers. If they did bad, spending too much time with other questions might have been the reason for it. If they did well in other questions they might have been short of time which is also worth examining.
There was something strange both about the trial and the real examination however. More than 77% of the students (111 persons) had questions with two correct answers. In these cases the two answers were absolutely the same only the composition was different. Without mentioning the exact questions and answers they had the following style:

a. X is smaller than Y.
b. Y is higher than X.

38 students have marked only 1 correct answer and have lost 0.5 point.
In the real exam the whole class (173 students) had this question among the tests one group has even got 2 from this type of question. The number of students with partly correct answers was 65 totally correct answers were given only by 54 people. It is despite the fact that in 3 groups this question was in the test in the trial exam as well. As a whole it can be stated that students do not read the exercises carefully and do not pay enough attention to the solutions.

Protecting a question database with low number of elements is important at the moment. Subsequently, the increase in the number of tests instead of the treasured secrets can open a test which the students may be practicing and learning purposes. Each time there are some students who try to get the questions previously and they are not even aware that it is harmful for them. The improper use of restraint beyond the means of learning bad habits can be rolled back to the electronic assessment. It is enough to think of students who usually prefer to go through workbooks and previous tests while preparing for an exam. They even try to memorize the letter of the correct answers. If answers are given in different orders these problems can be easily solved.
So far this situation has also had its advantage. The low number of questions allows the teachers more experiments without more extra work. In this case, the students submitted written tests of statistical test results are analyzed, it was expanded in the light of questions. Furthermore, and this experiment was not

against but for the students since they could also have the chance for practice. The positive results of this can be seen in Table 2.
The small size of the test database presently available cannot enable the tests to be issued to students with the purposes of studying and self-monitoring. Later, with the steep increase in the number of tests their issue will become possible for practice.

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THE ANALYSIS OF THE ATTITUDES OF THE STUDENTS AT ENGLISH LANGUAGE TEACHING DEPARTMENT TOWARDS THE EDUCATIONAL TECHNOLOGIES IN TERMS OF DIFFERENT VARIABLES

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Summary

One of the aims of the education is to train individuals according to the needs of the society. The individuals should not only transfer the information but also should use the educational technologies and reach the information with the help of them. Therefore, to grow up individuals who have this understanding is the responsibility of the educational system.

Determining the attitudes of foreign language teachers are extremely important as foreign language teaching is one of the main fields that the education technologies are widely used. Besides, defining the attitudes will lead more productive use of the educational technologies.

In this study, the attitudes of the students at English language teaching department towards the educational technologies were tried to define by using the scale developed by Pala (2006) which is titled "Attitude Scale towards Educational Technologies". The results were analyzed according to some variables such as gender, age, etc. Totally 111 students who continue their education at "Yıldız Technical University, Foreign Languages Teaching Department" participated in the study. Some suggestions were given based on the gotten results. Both the results and the suggestions will be presented in the paper.

Key Words:

English Language Teaching Department, Educational Technologies, Attitude

İNGİLİZCE ÖĞRETMENLİĞİ BÖLÜMÜ ÖĞRENCİLERİNİN EĞİTİM TEKNOLOJİLERİNE YÖNELİK TUTUMLARININ ÇEŞİTLİ DEĞİŞKENLER AÇISINDAN İNCELENMESİ

Özet

Eğitimin amaçlarından bir tanesi de toplumun gereksinimlerine uygun bireyler yetiştirmektir. Bundan dolayı eğitim anlayışı doğrudan bilgi aktarılan bireyler değil de eğitim teknolojilerini kullanabilen ve bu eğitim teknolojileri sayesinde bilgiye kısa ve verimli şekilde ulaşabilen bireyler yetiştirilmesi gerekmektedir.

Özellikle eğitim teknolojilerinin en çok kullanılmaya ihtiyaç duyulduğu alanlardan biri olan yabancı dil eğitiminde geleceğin yabancı dil öğretmenlerinin eğitim teknolojilerine karşı tutumlarının ortaya konulması, eğitim teknolojilerinin daha verimli kullanımı açısından önemli ve gerekli görülmektedir.

Bu çalışmada İngilizce Öğretmenliği Bölümü öğrencilerinin eğitim teknolojilerine yönelik tutumları, Pala (2006) tarafından geliştirilen "Eğitim Teknolojilerine Yönelik Tutum Ölçeği" kullanılarak tespit edilmeye çalışılmış ve çeşitli değişkenlere göre incelenmiştir. Araştırmaya Yıldız Teknik Üniversitesi İngilizce Öğretmenliği Bölümünde okuyan 1. ve 4. sınıf olmak üzere toplam 111 öğrenci katılmıştır. Araştırma sonuçları doğrultusunda önerilerde bulunulmuştur.

Anahtar Kelimeler

İngilizce Öğretmenliği Bölümü, Eğitim Teknolojileri, Tutum

Introduction

The expectations of the people to be able to live in a contemporary environment have brought the fast developments in technology. It can be said that the most important role is on the education. Therefore, we should use the technology effectively in educational activities.

Technological development which is seen as a product of educational process has also changed the structure of the process and has brought a different perspective to the understanding of the education (Keser, 1991).

Technology includes all machines, procedures, methods, processes, systems, management and evaluation which are utilized in the areas like science production, service, and transportation. In addition, it functions as a bridge between science and practice. Educational technology can be regarded as the process of structuring learning and teaching process, its practice and its development as well (Alkan, 1997).

Educational Technologies

The concept of educational technologies has moved far from the definition of "materials used in the education" and it has become one of the main disciplines including wide issues from human technology to the interaction. However, fast developments in the conceptual field have not been applied at the same speed.

Educational technology is a complex process which analyzes all problems that "human learning" includes. It develops appropriate designs by operating related issues (human power, information, methods, techniques, materials, organisations, etc.) and it applies them, evaluates and manages (Yalın, 2007).

One of the aims of the education is to train people according to the needs of the society. Therefore, it is needed to educate individuals who can reach the information effectively in a short time by the help of educational technologies and use these technologies. What we do not need are the ones who get the information directly (Alkan, 2005). The relation between technology and education were examined in terms of its effects on education. Main points were as below;

1. To transfer necessary abilities to the individuals
2. To train people who have the necessary qualifications of technological enviroment.
3. To take advantage of technological opportunites.

Educational technology has both direct and indirect benefits. Indirect benefits; it leads to creativity, changes the role of the teacher, makes the equality real, creates motivation, makes the education personalized, provides free education, brings the information from the first source, makes a system that can be copied. Direct benefits; it makes learning easier, it provides active learning, it makes concrete learning happen, it builds the base of the progressive learning and succeeds special aims in thinking (Rıza, 2003).

Even though education technologies have an important role and function on education, the one who makes the education meaningful and makes it functional and effective is the teacher. Considering the rapid developments in the technology and rise in the use of technology, teachers are expected to use these technologies at the schools and teach them (Akkoyunlu, 1995). In this context, it is extremely useful to examine the attitudes of candidate language teachers.

Attitude

Attitude is one of the actions that direct human behaviors. Attitudes of the individuals affect their love, hate and behaviors significantly (Morgan 1991). As a result, not only the evaluation of the attitudes but also to know the level of the attitudes is required in many fields (Erkuş 2003).

Attitude means "ready to action" in Latin origin (Arkonaç, 2001). Katz (1967) describes attitude as "pre thinking style of perceiving an object, person or the world with its bad and good sides depending on the values a person has".

Attitude is also a psychological structure seen as critical and important procedure of the cognitive, behavioral, perceptional sides of human behavior (Anderson 1988). Attitude is also something

acquired by learning, directing the behaviors of the person and causes bias in decision making process (Ülgen 1996).

METHOD

Method

A questionnaire was used in order to get data on demographic characteristics of the students and their attitudes towards usage of the educational technologies. The questionnaire used for this study which is named "Attitude Scale towards Educational Technology" was developed by Pala (2006). SPSS 17.0 Pack was used to make statistical analysis of the gotten data.

Model of the Research

The study was conducted according to scan model. In this model, it is tried to describe the group, case and variables separately (Karasar, 2004). The reason to use scan model is to define the attitudes towards technology in a neutral way.

Sample

Sample includes 111 undergraduate students studying "Yıldız Technical University, the Faculty of Education, Foreign Languages Teaching Department" in 2010- 2011 spring term. All the students at all grades were taken into sample but the ones who did not participate in the study were not taken into consideration.

Data Collection Tool

As a first step an information scala designed by the researchers for demographic features in order to analyze students' attitudes toward education technologies in terms of several variables was used and later "Attitude Scale toward Educational Technology" was applied.

The scale named ""Attitude Scale towards Educational Technology" was developed by Pala in 2006. Cronbach Alpha reliability coefficient was found 0.92. The scale which was organized as Liker type includes 43 items.

Data Collection Process and Data Analysis

The data of the research was gotten during 2010- 2011 spring semester. The option of "totally disagree" was calculated as one point and the option of "totally agree" was calculated as point 5. The lowest score which will be gotten is 43 and the highest score is 215. Total point of "totally disagree" corresponds to 43- 77, 78-111 corresponds to "disagree", 112-145 corresponds to "undecided", 146-179 corresponds to "agree" and 180-215 corresponds to "totally agree". High total point means high attitudes towards educational technologies.

t Test was used in order to determine whether there is a meaningful relation between gender and attitudes towards educational technologies. One-Way Anova was wanted to be used whether there is a difference according to the type of the high school or not. However, as there is only one graduate from vocational high school, t-Test was used again.

FINDINGS and COMMENTS

%76 percent of the students who participated in the study was female students () and %24 percent was male students (n=27). 85 percent of the students (n=95) are graduates of Science/Anatolian/Anatolian Teacher's High School and the others are graduates of high school and one is the graduate of vocational high school. %93 percent of the students stated that they have computers at home and %80 percent has internet connection as well.

%68 (n=76) of the students find themselves successful in computer usage. %85 (n=94) of the students indicated that they have not taken computer education outside of the school enviroment. % 67 of the students (n=74) gave "no" as an answer for the question of "Have you taken any education on educational technologies in English language teaching?".

The average attitude score towards educational technology is 147. This average corresponds to the item of "agree". This shows that the attitudes of the students towards educational technology are positive. This finding is similar to the results of the study conducted by Çardak and the others (2001). The study they conducted has determined the attitudes of candidate science teachers and it was found that they developed positive feelings towards technology.

Table 1: Comparison of the Attitude Level towards Educational Technology according to Gender

Gender	N	Average	Standard Deviation	p
Female	84	147	14,88	,601
Male	27	150	12,31	

According to table 1, while the average attitude score of female students' towards educational technology is X=147, the average attitude score of male students' attitudes towards educational technology is X=150. When P value (p>,05) was examined it was seen that difference between the attitudes of female and male students was not significant.

It was also stated in the study analyzing attitudes of candidate maths teacher by Özgen ve Obay (2008) that there is no significant difference related to "gender" variable.

Table 2: Comparison of the Attitude Level towards Educational Technology According to Type of the High School

High School Type	N	Average	Standard Deviation	p
Science/Anatolian/Anatolian Teacher's High School	95	148	14,84	,538
High School	13	142	10,58	

According to Table 2, the average attitude score of Science/Anatolian/Anatolian Teacher's High School graduates is X=148 whereas the average attitude score of High School graduates is X=142. When P value was examined (p>,05) there is no significant difference statistically between the graduates of Science/Anatolian/Anatolian Teacher's High School graduates and High School graduates.

This finding correlates with the results of the study conducted by Can (2010) and Günhan and the others (2008). They found that there is no significant difference between students' attitudes towards educational technology in science teaching and class teacher departments and the high school type.

Table 3: Comparison of the Attitude Level towards Educational Technology According to the Success Perception

In Computer Usage	N	Average	Standard Deviation	p
Finding himself successful	76	147	15,47	,336
Finding himself unsuccessful	33	149	11,91	

According to Tablo 3, while the average attitude score of the students who find themselves successful in computer usage is X=147, the average attitude score of the students who find themselves unsuccessful in computer usage is X=149. According to P value (p>,05) it can be said that there is not significant statistical difference between the attitudes of the students in these two groups.

CONCLUSION and RECOMMENDATIONS

According to the findings of this study it revealed that the students' attitudes towards educational technology in English language teaching department are positive at the level of "agree".

It was also found that there is no significant difference between the attitudes of male and female students.

Even though the attitudes of Science/Anatolian/Anatolian Teacher's High School were found higher in the comparison made according to high school type, it can be said that there is no significant difference between graduates of Science/Anatolian/Anatolian Teacher's High School and High school graduates in terms of statistics.

Significant difference between the students who find themselves successful or unsuccessful was not also determined.

It is a fact that integration of educational technologies increases the success of the education. As a result of this, it is needed to focus on the courses which transfer necessary technological skills especially at undergraduate curriculum.

This study included candidate English language teachers. It may be suggested to conduct the same study with the students studying at different teaching departments.

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THE APPLICATIONS OF OPEN SOURCE SOFTWARE IN PROMOTING EFFECTIVE EDUCATION MANAGEMENT AND LEADERSHIP TRAINING

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Abstract: This study aims to investigate the use of e-learning among future school heads in education management and leadership. The study was conducted in two phases. The first phase focused on developing a learning management system using open source software - *Moodle*. This phase emphasized on the processes involved in designing and developing the learning management system prototype called *E-Headship*. The second phase evaluated participants' suitability in becoming future school leaders and managers through the use of *E-Headship* for the National Professional Qualification for Headship (NPQH) programme. *E-Headship* was then evaluated in terms of the applications of the learning management system. Sixty (60) participants from Institut Aminudin Baki (IAB) - an institute for training school administrators took part in the study. The data were analyzed using descriptive statistic focusing on reporting of the results in percentile, means, standard deviation and frequency. As it compared the performance results of two groups, a simple T-test was also performed. The results revealed that *e-Headship* has succeeded in promoting teaching and learning strategies to a higher degree. It is hoped that the use of such prototype will help the education institution in designing and developing better programmes that could benefit the participants at large.

Key-Words: - open source, education, leadership, management, learning management system, school administrators

Introduction

The development in information technology has now moved from the first wave that emphasises on computer technical skills to the second wave which focuses on the application and management aspects (Adams & Morgan, 2007). The second wave in online learning technology emphasises more on the administration and management of information technology. In other words, online learning explains how man manages technology in their daily lives. Ready-made software and system are abundant in today's market but the problem remains: how are developing countries use the available software with a budget that fits their pockets? A study has found out

that Free Libre Open Source System (FLOSS) is very potential in using open source system and also has contributed to the education system (Ghosh, 2004). A research in Bhutan discovered that poor developing countries have to fork out a substantial amount of their GDP to obtain legal licence and original software (Ghosh, 2004).

Based on the research mentioned, profit is not the main factor in developing open source software. Only 13% of open source users use it to gain profit. Most designers and software users agree that between 70% to 78% use open source based on social principle which is knowledge sharing and learning and developing new skills. Therefore, choosing to operate on open source is a wise decision for non-profit government and non-government agencies (Preston et al, 2010). The main challenge in online technology applications in education management and administration is adapting matters which are related to educational administration policy of a country, pedagogical approaches and learning theories. The understanding of using technology in management and administration is mostly geared towards the uses of technology in industrial management and not in education. This inevitably call for an effort in developing the technology for online learning that adapt pedagogical approaches and embrace learning theories. In this scenario, there is a need to involve experts in the education field to select the content materials. Research shows that the use of open source in education can benefit the education field. Educators and webmasters could design and mould it in accordance to the needs of the institution (Gosmire et al. 2009)

This paper describes the use of learning management system among future school heads in education management and leadership. The study was conducted in two phases. The first phase focused on developing a learning management system using open source software - *Moodle*. This phase emphasized on the processes involved in designing and developing the learning management system prototype called *E-Headship* for the National Professional Qualification for Headship (NPQH) programme. The NPQH Programme is a one-year course on management and administration leadership designed for school leaders held at Aminuddin Baki Institute, Ministry of Education, Malaysia. The second phase was on the evaluation of participants' suitability in becoming future school leaders and managers through the use of *E-Headship.* It was evaluated in terms of the applications of *E-Headship.*

Open source software - MOODLE

The technology development and advancement accelerates globally. The existence of Microsoft which revolutionised computer software is a mark of that advancement. There is no doubt that computer system designers made a great fortune from their work and gained massive popularity. However, not all system designers design for profit. For instance, *Moodle*, an open source software, which was developed by Martin Dougiamas is one of the examples of software that emphasises on online learning which does not operate on profit. Martin Dougiamas is an educationist who has smartly combined the pedagogical knowledge of education and computer technology together which enriches the education of the 21st century. From *Moodle*, individuals or organizations are given the permission to download the software free of charge and the downloading comes with license (William, 2006). The system is equipped with all aspects of online learning such as the ability to store learning resources, communication and activities that are based on certain learning topics (Williams, 2005). The interesting features of *Moodle* includes downloading and

sharing of documents, developing content in HTML, forum or discussions, quizzes, grading, formatted questionnaire, journal writing and other features which are seen as important to the development of online learning.

The programme, *Curriculum, Technology and Education Reform (CTER)* which was executed by College of Education, University of Illinois in 1998 uses *Moodle* (Gosmire, 2009). The programme has successfully produced post graduates who mastered three areas of education: curriculum, technology and reformation in education. The findings encompassed that most in-service teachers gave favourable feedback towards the online learning programme. The CTER programme combines various teaching methods that could promote learners' acquisition of knowledge. Another advantage that was brought in by online learning is the fact that it has changed the society's perception on lifelong learning. Online learning has allowed learners to learn in a virtual world. This, in turn has increased the number of diploma holders as well as those who try to get a degree while working. It has also increased the number of professionals who gained a second degree. This proves that online learning is widely accepted (Norazah, 2002). Although initially the online learning is viewed as any other method of learning, the perception is gradually changing. Many countries see this as an alternative mode in developing and training their human resource. Furthermore, ICT is seen as a 'push factor' that could solve many educational problems across the countries in the world (Levin et al. 2009).

Methodology

This section details the design and development of the learning management system, using *Moodle* for management and school leaderships, *E-Headship* the National Professional Qualification for Headship (NPQH) programme. The study was conducted in two phases. The first phase focused on the development process of *E-Headship.* The second phase stressed on evaluation of participants' suitability in becoming future school leaders and managers through the use of *E-Headship* for the NPQH Programme. The participants were the NPQH candidates at the Aminuddin Baki Institute (IAB), Ministry of Education, Malaysia. IAB is a training institute on management and educational leadership. It was evaluated in terms of the applications of *E-Headship*.

The process of designing, developing, implementation and evaluation of *E-Headship* was based on the model of Holistic Cycle (Norazah, 2002) and web development model for education (Perrin & Mayhew 2000). The conceptual framework is shown in Figure 1.

In the first phase, during the design process of *E-Headship*, it was ensured that all technical aspects such as the registration process, the main menu, updating content materials, links and arrangement, graphic and user guide were user friendly and learner centred. In setting up the *e-Headship* format, *Dreamweaver* software was used and the PhP configuration system was modified using *Moodle*. In the development of the teaching and learning content, softwares such as Microsoft PowerPoint, Microsoft Word, Flash and Raptivity were used.

In the second phase, the evaluation of *E-Headship* was done in terms of the applications the leaening Management system. The applications involved were the accessibility, registration process, e-content, interactivity and forum/quizzes. Sixty

(60) participants who were the NPQH candidates took part in the study. The data were analyzed using descriptive statistic focusing on reporting of the results in percentile, means, standard deviation and frequency.

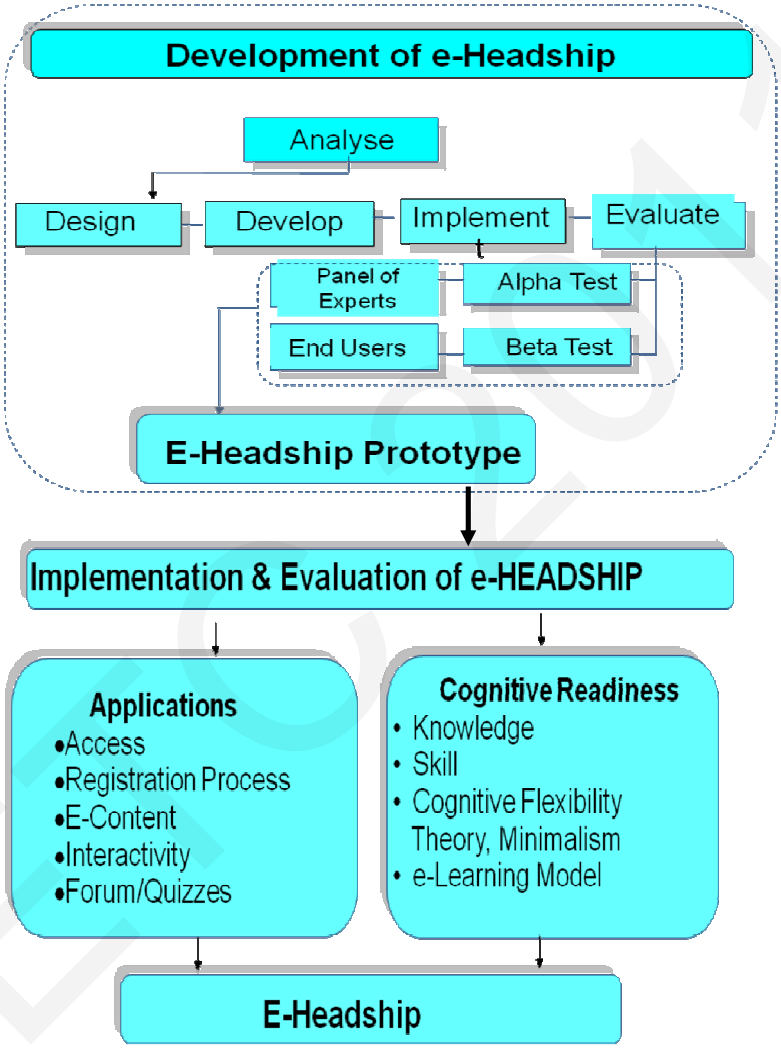

Figure 1 E-Headship Conceptual Framework

Findings

The research findings are as follows:

Accessibility of *E-Headship*

In this research, the interface menu system used was based on *Moodle*. Amendments were made to suit the needs of the NPQH Programme as well as to adhere to the suggestions made by the experts of the system and NPQH content. Figure 2 shows one of the interfaces of *e-Headship*.

Figure 2 The Interface of *E-Headship*

Table 1 Data distribution the accessibility of *E-Headship*

ITEM	Mean	Std-Deviation
E-Headship is user-friendly.	4.03	.414
E-Headship module is easy to use.	4.17	.379
Access for *E-Headship* is smooth and fast.	4.03	.615
E-Headship has clear instructions.	4.07	.521
E-Headship has easy to understand user- guide	4.10	.548

Based on Table 1, the respondents agreed that *E-Headship* was user friendly (mean 4.03), the menu system was easy to use (mean 4.17), *E-Headship* is quick access system (mean 4.03) and it has clear instructions (mean 4.07).

***E-Headship* Registration System**

Moodle is equipped with registration system to ensure that the recorded information system and participants data were well kept. Figure 3 shows the registration system of E-Headship that was developed using Moodle format. It takes into account the safety features as well as users' information accessing this system.

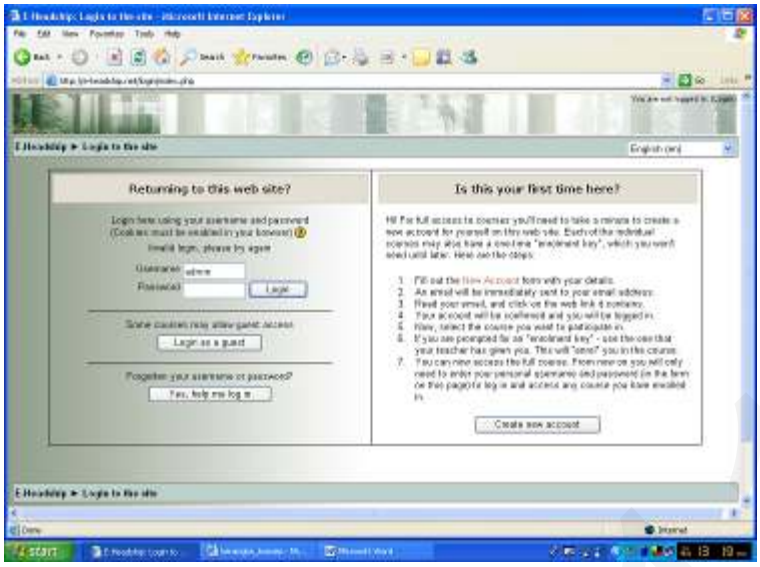

Figure 3 Registration system of *E-Headship*

Table 2 The data on *E-Headship* registration process

ITEM	Mean	Std-Deviation
E-Headship registration system has easy to understand instructions.	4.07	.583
E-Headship registration system does not require high skill technology.	3.97	.615
E-Headship registration system is user friendly.	4.03	.556
E-Headship registration system is simple and easy to acquire.	4.00	.587
E-Headship registration system is smooth running.	4.13	.507
E-Headship registration system is effective and quick to access.	4.03	.490

Table 2 showed that the respondents agreed that the registration system was easy to understand (mean 4.07), does not need high technology skills (mean 3.97), user-friendly (mean 4.03), simple and easy to use (mean 4.00), efficient (mean 4.13) and effective and quick to access (mean 4.03).

E-Headship Content

The teaching and learning content of *E-Headship* is one of the most important aspects in the development process. The content must adhere to the needs of the school leaders and managers and in line with the courses covered in the education management and leadership -NPQH. Figure 4 shows the list of courses in *E-Headship*.

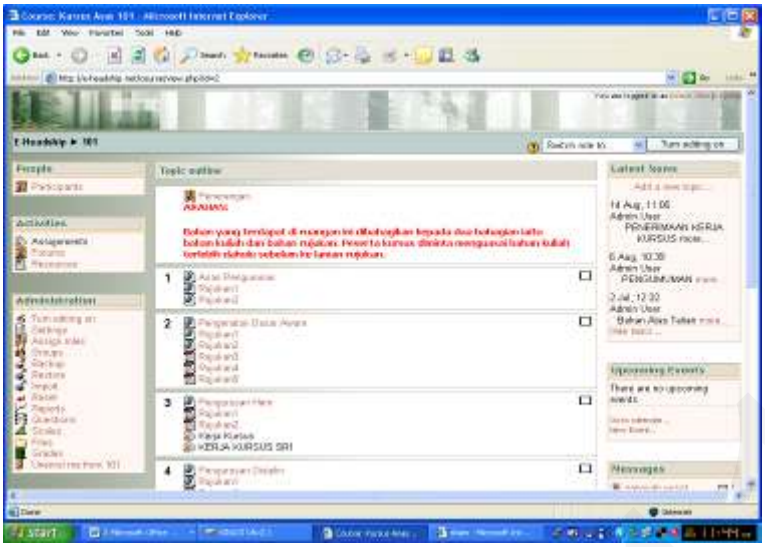

Figure 4 The list of courses in *E-Headship*

Table 3 *E-Headship* learning content.

ITEM	Mean	Std-Deviation
E-Headship content is developed to suit my level of knowledge.	4.00	.371
E-Headship content can increase self-motivation towards learning.	4.17	.531
E-Headship content requires minimum time to access.	4.03	.490
E-Headship content satisfies the objectives of the course.	4.07	.450
E-Headship content increases my understanding of the subject matter.	4.13	.434
E-Headship content uses technology that suits my ICT skill level.	4.17	.461
E-Headship content provides links to broader online information.	4.10	.403
E-Headship content is organized systematically.	4.13	.434
E-Headship content diversifies my learning methodology.	4.13	.507

Table 3 showed that the respondents agreed that the *E-Headship* content is suitable with the level of their ICT skille. (mean 4.00), provides self motivation (mean4.17), requires minimum time to access
(mean 4.03), the content suits the objectives of the course (mean 4.07), increases understanding (mean 4.13), uses appropriate technology (mean 4.17), provides suitable links (mean 4.10), systematically arranged (mean 4.13), and enables diversity of learning methodology.

E-Headship Forum, Quiz and Discussions

Online communication and interactivity between learners and lecturers play very important roles in determining the effectiveness of a learning management system. This is due to the fact that students were not able to meet face-to-face with the lecturer all the time. *E-Headship* is equipped with chatting and messages modes to ensure smooth communication between students, education administrators and lecturers. Figure 5 shows the chatting room in *E-Headship*.

Figure 5 Forum and Messages in *E-Headship*

Table 4 Respondents' feedback on the *E-Headship* Forum and Quizzes

ITEM	Mean	Std-Deviation
The forum in *E-Headship* helps in my learning process	4.00	.455
E-Headship quizzes increase my understanding of the subject matter.	4.00	.455
Discussions in *E-Headship* help my understanding of a topic.	4.13	.507
Discussions in *E-Headship* help to increase communication with course-mates.	4.03	.556
Discussions in *E-Headship* help students exchange information.	4.00	.525
Discussions in the forum help me in understanding a topic quicker.	4.10	.548
Forum in *E-Headship* helps to quicken the information delivery system.	4.17	.461
Forum, quiz and discussion in *E-Headship* learning supports my classroom learning	4.07	.583

Table 4 shows that the respondents agreed that the forum helps in their learning process (mean 4.00), the quizzes incorporated in the forum increase their understanding of the subject matter (mean 4.00), Discussions in *E-Headship* help their understanding of a topic (mean 4.13), help to increase communication with course-mates (4.03), help students exchange information (4.00), help them in understanding a topic quicker (4.10) and helps to quicken the information delivery system (4.17). The results also showed that the Forum, quiz and discussion in *E-Headship* supports their classroom learning.

Conclusion

Many learning institutions have implemented efficient learning management system from the open source software. Research findings on the perception of the future school heads in education management and leadership towards *E-Headship* are encouraging and remain very positive. They perceived the learner-to-content interaction, learner-to-learner interaction, learner-to-instructor interaction in the *E-Headship* positively. The studies by Gosmire et al (2010) also reveals similar positive interaction. The design and development of *E-Headship* has succeeded in promoting teaching and learning strategies to a higher degree. These findings are parallel with many studies on the effectiveness of the integration of technology in the teaching and learning process (Gregory & Beyrer (2010), Effandi et.al (2007) and Uys (2010) & Dell et al (2010). Their studies revealed that web-based learning could increase learning motivation. Therefore, opting for open source is in line with the mission of higher learning institutions (Kovalik & Hosler (2010 & Wilburt (1997). By incorporating the theories of learning and teaching strategies, *E-Headship* dship has succeeded in enticing and encouraging school administrators to further explore the function of ICT in education.

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THE ATTITUDES IF EDUCATIONAL PREPARING STUDENTS WHO HAVE INTEL CERTIFICATE TOWARDS TRAINING CASE PROGRAM

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Abstract

This study aimed at recognizing the attitudes of educational preparing students who, have intel certificate following study questions: what are educational preparing students attitudes who have got intel course towards the training course program? Are there statistical differences at the level (= 0.05) in the means of teachers attitudes who Intel course towards the training course program due to scientific degree and teaching experience variables? the scale consisted of (40) items in order to make sure of the scale validity, the study instruments and the instrument as whole were calculated the study findings showed that teachers attitudes toward the training course program were in middle degree, also, the findings showed that, there were statistical differences in favor of (Bachelor) with mean (3.59), and experience years, in favor of (Less than 6 years) with mean of (3.79) the researcher recommended that teachers must follow modern electronic method in teaching.

Introduction

During the past two decades, electronic programs in the universal universities witnessed a wide spread because of the great successes in the combination of education technology and information technology as well as the development of the culture of community in the use of the Internet; such programs include Intel (education for the future) which help both teachers and students to get to know the potentials of science and technology in education; the program provides a comprehensive and flexible training course in which the teachers train other teachers regarding the ways of integrating technology into the daily lessons provided to their students; the program employs skills and integrates technology with curriculum to improve the way of teaching in the classroom to an advanced degree so that teaching starts using computerization and electronic learning-mail, which would give the students more opportunities in learning, develop and enrich their thinking skills and encourage them to analyze, create , discuss and interact with each other. Furthermore, the program helps teachers to acquire the proper planning of the future of students and the development of their learning through the use of more sources of knowledge and means of modern technology, which supports the job effectively through the use of the Internet, (Tokan, 2004).

The Problem of the Study

The problem of the current study comes from the reality of the Jordanian universities regarding the computerized projects such as education for the future project (Intel) which most students of educational qualification and university students trained on using. The researcher, a teacher of education technology, believes that there is a wide gap between the views and trends towards these programs which led to not achieving the objectives as required. the traditional methods of education are still used throughout the universities and schools of Jordan, as well as the fact that many devices and laboratories ,that have been processed for the purposes of e-learning, were consumed before being invested in a real way, or may have been used for other purposes, such as providing Internet services. Because of the fact that the human

factor is important in any job and because the researcher works in the field of e-learning, it was noted that there was a variation in the views of the trainees 'specially those educationally qualified regarding Intel, a modern program. There are some other reasons such as the confusion in our knowledge about the nature of individuals' trends to such programs, the belief of the researcher in the importance of knowing such positions, and the importance of the variables of training programs and trends, the researcher was eager to know and study the trends of the teachers who completed the Intel course and started the training course of the program, as well as the training and administrative obstacles they face during the program; therefore, the problem lies in the training and the trends towards it.

The Importance of the Study

The importance of the study lies in its being rare in the field of education in Jordan, which includes Intel, so it is possible that this study enriches the local educational literature in this field; furthermore the importance of this study comes from the fact that its findings might help the educational planners and officials in the Jordanian universities to know the reality of the training programs and the variables that might affect the teachers' trends toward those programs, which play an important role in letting teachers receive such trends. Also the importance of this research comes from its simultaneousness with the current attempts at the Jordanian universities to study the possibility of applying the programs of e-Learning and the fact that such topic has become the focus of professionals in the field of information technology and education in the Arab world being a feature of the Information Society, which is considered today an indication of the level of advancement and progress of countries. Finally, the importance of this study comes from paving the way for future researchers to conduct other field studies related to Intel in the light of other variables.

Procedural Definitions

Trend: the tendency of the individual towards positive or negative trends.
Intel: education for the future is a global program that helps teachers in employing technology in education in the classroom and enhancing students' learning. This program provides a comprehensive and flexible training course depending on the effectiveness of direct and practical training.
Students of educational qualification: teachers who have obtained Intel training certificates and designed computerized educational packages in the years 2009/2010; they are also qualified for the bachelor degree and diploma degree in Education.

Studies conducted in this area

Al-Majali (2009) conducted a study that aimed to investigate the effect of using Intel's package in teaching mathematics on the students of the ninth grade in the Directorate of Amman the fourth. This study has attempted to answer the following questions: What is the impact of using Intel's packages on the achievement of ninth grade students in the Directorate of Amman the fourth compared to the regular way? Are there statistically significant differences at the level of the statistical significance ($\alpha = 0.05$) in the means of the ninth grade students' grades due to the method of teaching?. Are there statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the means of the ninth grade students due to the interaction between the teaching method and gender? The results of the study showed statistically significant differences at ($\alpha = 0.05$) in the post-achievement between the students of the experimental and control groups due to the variable of the teaching method for the benefit of students using Intel's packages and the students' gender in favor of females. The study did not find any statistically significant differences at the significance level ($\alpha = 0.05$) due to the effect of the interaction between the teaching method and the gender of students and the study recommends conducting further studies and researches on the impact of e-learning on the students' achievements and trends towards the computerized educational materials.

Ateya (2009) also conducted a study that aimed to analyze the trends of graduate students in the Faculty of Educational Sciences at the Hashemite University towards e-learning applications, and recognize the effect of both the cumulative average and experience on the electronic courses. The study sample consisted of (70) male and female students from the Master's Program in the Faculty of Educational Sciences who have been randomly selected and a questionnaire has been used consisting of (44) items which was developed to assess the trends of students. The study results have revealed the presence of positive trends of graduate students in the Faculty of Educational Sciences towards e-learning

applications, while there were no statistically significant differences in the trends of graduate students towards e-learning applications due to the cumulative average and experience in the electronic courses. in light of the results of the research, some recommendations have been provided such as expanding the use of e-learning applications at the Hashemite University with the graduate students in particular being the future leaders of e-learning in the future and because of the fact that this type of learning is permanently renewed, which makes the students in touch with everything new in the world of e-learning.

Reason, Valadares & Slavkin, 2005 conducted a study comparing between the regular, compact and electronic methods of learning in terms of achievements and trends among the students of the Faculty of Economics. the study sample consisted of (403) students distributed to three groups, the first group conducted their studies by e-learning via the Internet, the second one conducted their studies in the regular way, and the third group conducted their studies by the integration between the method of e-learning and the regular way. The results showed that the achievement of the students of the third group was higher than that of the second and third groups; their trends were more positive, while the trends of the group which conducted their studies by e-learning were more positive than the one conducting their studies in the regular way.

Bark 2005 conducted a study that aimed at exploring the relationship between computer trends , frequency of use and the transmission of the impact of training on the various conditions of e-learning; the results have proven the effectiveness of various e-learning environments in creating positive trends towards technology ; the study has an important role in the transmission of the impact of training for learners.

Mark, Van't 2005 conducted a study that aimed to identify the impact of using hand-held technology on the teaching and learning of social studies for the pre-service teachers and investigate their future trends towards the integration of technology in teaching social studies. The study indicated to the effectiveness of using handheld computer technology in teaching social studies in secondary schools and the development of the trend towards the integration of technology in teaching social studies.

Methods and procedures

Community study

The study consisted of all the students of educational Diploma qualification in the various specialties of the faculty of educational science faculties at Mutah university and Al-Tafila Technical University, and the students registered in the first semester amounting (150) male and female students according to the data available from the departments of the universities for the academic year 2010/2011

The study sample

The study sample consisted of (100) students in the educational qualification who obtained (Intel) certificates towards the training program, who were randomly selected from the study community,

The Study Tool

The researcher designed the scale as a study tool to measure the trends of students of educational qualification who obtained Intel training certificates after returning to the books and the previous studies; the scale consisted of (55) items.

The ratification of the study instrument

The veracity of the tool has been checked by submitting it to a panel of judges consisting of (12) competent and experienced arbitrators from the members of the faculty at the University of Al-Tafileh, Mutah University, and the University of Jordan. According to the observations of the judges, the formation of some items has been modified in terms of construction and language; 15 items have been deleted; therefore, the scales consisted of (40) items.

The Reliability of the scale trends

To ensure the stability of the scale, the researcher applied it on a sample outside the study sample consisting of (45) male and female students with a two-week interval between the first and the second application. Pearson correlation coefficient was calculated between the results of the two applications of

the scale which was (0.88), and Cronbach alpha's reliability coefficient was also calculated , which was (0.86).

The study variables

The study included the following variables:
First: the independent variables
Degree: It has two levels: (diploma, BS).
Number of years of academic experience: It has two levels: (less than 6 years, 6 years and over).
Second: the dependent variable:
It represents the trends of the students of the educational qualification who obtained Intel certificates towards the training package; it is expressed as arithmetic means for the estimates of the study sample of the items of the trends scale, which was designed for this study.

Results and discussions

First: the Results of the study questions:
The first question: What are the trends of students of the educational qualification who obtained Intel certificates towards the training program?
To answer this question, we have calculated the means and the standard deviations of the entire study tool and the tool as a whole and applied One Sample T-test on the tool as a whole; table (2) explains this.

Table (2)
The arithmetic means and the standard deviations for all the items of the study tool and the tool as a whole (n = 100)

Number	item	arithmetic mean	standard deviation	level	Evaluation degree
1	The training package provided me with high technical skills	3.71	1.17	11	high
2	Education via multimedia takes into account the individual differences among students	3.64	1.11	14	Medium
3	I feel that the training package does not give me the strength to think and reason	3.39	1.09	25	Medium
4	the objectives of the training package express the actual needs of students	2.76	1.21	39	Medium
5	I prefer getting information through the internet and not from books and studies.	3.64	1.04	14	Medium
6	the lectures via the training package encourage students to use critical thinking processes	3.98	1.21	5	high
7	I feel tired during teaching via the training package	3.38	1.06	26	Medium
8	I find it difficult to provide the capabilities and the technical equipments for e-learning.	3.33	1.15	29	Medium
9	The goals of the training package are clear and specific to the trainees from the beginning.	3.91	1.05	9	high
10	the training package training is able to arouse my curiosity care	3.87	1.03	10	high
11	The training package helps to acquire various teaching skills for the presented concepts.	4.35	0.93	1	high
12	I think that the training package has opened the way for students to train for using the computer and acquire its skills.	2.77	1.24	38	Medium
13	time runs quick during the study through the training package	3.50	1.23	21	Medium
14	I hate the use of computerized educational software in learning because it weakens the relationship between the teacher and the student.	3.12	1.29	33	Medium
15	the training package needs high teaching skills	3.51	1.14	19	Medium
16	I feel that the training package is a waste of time and effort in the teaching processes.	3.22	1.35	32	Medium
17	I think that learning via multimedia encourages the development of the spirit of collective cooperation and increases familiarity among students.	3.41	1.05	23	Medium

18	I think that the training package enabled me to learn a lot of information in a short time.	3.35	1.25	28	Medium
19	How nice it would be that teachers benefit from the training package method in their teaching.	3.07	1.30	35	Medium
20	I think that the use of multimedia would be one of the best and effective methods of teaching.	3.25	1.25	31	Medium
21	The use of the training package prompts worry and lack of attention.	3.51	1.18	19	Medium
22	The training package increased my interest in the courses that I teach.	3.97	1.13	7	high
23	I think that the training package works on raising mental thinking among students.	4.05	1.11	3	high
24	The use of advanced scientific means in education has a positive impact on the education of students and their academic achievement.	3.65	1.02	13	Medium
25	I guide students through multimedia such as the computer and the Internet.	3.36	1.07	27	Medium
26	I have difficulty in teaching the lectures to the students via multimedia.	4.11	0.94	2	high
27	I vary in the teaching methods between the traditional learning and multimedia.	3.55	1.22	17	Medium
28	I think that the distribution of the days on the units was inappropriate.	3.26	1.24	30	Medium
29	I think that the training package helps to dispense with the printed sources significantly.	3.98	1.09	5	high
30	I think that the Encyclopedia of photos, graphics, shapes, and sounds was inadequate for the purpose.	3.71	1.27	12	high
31	I think that the trainee faced difficulties during using the cds attached with the training material.	3.40	1.13	24	Medium
32	I think that the training package might have contained adequate educational techniques and sources.	2.96	1.15	37	Medium
33	I find difficulty in translating the samples related to the computerized learning package when dealing with the training package.	3.63	1.11	16	Medium
34	I think that the content of the training package cannot be applied to all of our school courses.	3.47	1.26	22	Medium
35	I think that the student sample in the training package has increased the ability of students in the preparation of reports and researches.	3.10	1.13	34	Medium
36	I think that the Websites contained within the training package commensurate with the age of students targeted	2.60	1.11	40	Medium
37	I think that the Office software used in the training package commensurate with the modernity of the content of the training package	3.94	1.20	8	high
38	I believe that the training package is presented in sequence and logic.	3.52	1.15	18	Medium
39	I believe that the training package had given the trainee the adequate capacity for the design of computerized teaching package.	4.00	0.95	4	high
40	I think that Intel is the perfect solution to the various issues of teaching.	3.02	1.22	36	Medium
The tool as a whole / the trends of the students of the educational qualification who obtained Intel towards the program of the training course.		3.50	0.62		Medium

It appears from Table (2) that the arithmetic means of the trends of the educational qualification students holding Intel towards the training course program are between (2.60-4.35); the highest was for the item " the training package helps to acquire the various skills of teaching the presented concepts", while the lowest was for the item "I think that the Websites contained within the training package commensurate with the age of the students targeted", and the arithmetic mean of the tool as a whole was (3.50) with a medium degree.

Table (3)
The results of applying One Sample T-test on the tool as a whole (n = 100)

Field	arithmetic mean	standard deviation	T	freedom degrees	statistical significance
the tool as a whole / the trends of	3.50	0.62	8.036	99	0.00

the educational qualification students holding Intel towards the course training program					

Table 3 shows that there is an intermediate level for the trends of educational qualification students holding Intel towards the course training program; the arithmetic mean of the tool as a whole was (3.50) with a medium degree and the value of (T) of the tool as a whole was (8.036), which is a statistically significant value at the significance level (α = 0.05); this indicates the existence of a statistical significance for the trends of the educational qualification students holding Intel towards the course training program. The researcher attributes that the medium trends of the students towards the training program of the course might be due to the variables of positions: time, preoccupation with work, attending lectures frequently, as well as the fact that both the teacher and the student were not fully ready to use the program in a way that gives the true image of the program in order to form a positive direction.

II: the results of the study questions:

The second question: Are there any statistically significant differences at (α= 0.05) in the means of the trends of the teachers holding Intel towards the course training program due to any of the following variables: Degree and teaching experience?

To answer this question, we have applied Independent Samples T-Test on the tool as a whole according to the scientific degree and the teaching experience. Table (5) explains this.

Table (5)

The results of applying Independent Samples T-Test on the tool as a whole according to the scientific degree and the teaching experience.

Variable	level	arithmetic mean	standard deviation	T	statistical significance
scientific degree	Diploma	2.98	0.54	3.74	0.000
	BA	3.59	0.59		
Number of years of academic experience	less than 6 years	3.79	0.43	5.05	0.00
	6 years and above	3.23	0.65		

Ttable (5) shows the presence of statistically significant differences (α= 0.05) between the arithmetic means of the trends of teachers holding Intel towards the course training program due to the scientific degree; the value of (T) was (3.74), which is a statistically significant value at the significance level (α = 0.05), for the benefit of academic qualification (BA) with an arithmetic mean of (3.59), while the arithmetic mean of the scientific qualification (diploma) was (2.98). The researcher attributed this result to the presence of the averages of the bachelor degree being the most distinguished degree and experience giving more opportunities for the program to be distinguishable from the other qualification, diploma.

Ttable (5) shows the existence of statistically significant differences at (α= 0.05) between the arithmetic means of the trends of the teachers holding Intel towards the course training program due to the number of years of academic experience; the value of (T) was (5.05), a statistically significant value at the significance level (α = 0.05) for the benefit of the period of experience (less than 6 years) with (3.79) as an arithmetic mean, while the arithmetic mean of the period of experience (6 years and above) was (3.23). The researcher attributed this result with the fact that the less experienced teacher is more willing and at work, which led to the development of capacities in order to reach to a technical level appropriate to the academic expertise.

Recommendations

1 – the importance of using modern electronic methods of teaching by teachers and activating the role of technology in the institutions of higher education.

2 - Working on holding educational workshops and training programs for e-learning in the institutions of higher education

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THE BUSINESS COMMUNICATION COURSE AND THE MOODLE FRAMEWORK SYSTEM

Experiences at the Budapest Business School, College of International Management and Business (Hungary)
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Abstract: In my presentation I will argue that the use of learning content management systems is also justified in full-time education, especially in business education and communication studies. Nowadays not only multinational companies, but domestic medium enterprises also manage the training of new employees and existing staff with LCMSs. Companies in Hungary's financial sector are cutting edge in the development of electronic learning objects, and base employees' training on these new technologies. That is why it is extremely important for students to get acquainted with learning management systems and other web-based applications as tools that support the learning process and also as sites of communication. I will present the business communication Moodle course, which was introduced to international business and commerce and marketing studies in the 2010/2011 academic year. I want to present the wide range of web2.0 applications that can be used to explore the fields of business communication.

Keywords: LCMS, e-learning, business communication, user tracking

Introduction

Today, when our students (as well as our colleagues) spend a significant proportion of their spare time on Facebook and similar networking sites and virtual communities, communication cultures and expectations in the workplace also seem to be changing. (More than half of the Hungarian Internet users between 18 and 64 enter at least one networking site - iWiW, Facebook, Myspace, Twitter etc. – each day according to domestic surveys. www.technet.hu) Professional blogs, analyses, audio and video commentaries published on the Internet (message boards, profile pages, photo, file and other content sharing sites) have by now become part of business communication, and consultations can also be held online in education. However, when our students are asked if they know what web 2.0 means or what is behind the expression semantic web, we invariably get negative answers. Therefore it seems necessary to set some concepts, phenomena and applied tools straight, even within the sometimes rather narrow frames of subject curricula. The business communication course offers a good opportunity for this. Its perspective as well as its content (curriculum) enables it to follow technological changes felxibly, and the innovations of social and new media can be presented at the attendance courses and alongside them. The question is whether the institutions and the students are open to receive this, and how well the instructors themselves are prepared for it.

Teachers

As regards the skills of teachers, the National Institute of Vocational and Adult Education has provided accredited in-service teacher training programs related to e-learning for years, under titles like „E-learning, „The School of the Future", „From Synopsis to E-learning curricula", „E-textbook – developing electronic curricula in the framework system", etc. (https://www.nive.hu) (The author of the present paper also participated in such training courses.) However, no imperative other than their self-imposed professional standards and motivation is in force as yet in domestic practice to incite teachers to participate in these programs. (The new act on public education and act on higher education, the model for teachers' careers, as well as the principles of quality assurance are currently being outlined as part of the reform measures of the second Orbán government that came into office last year. The plans are as yet subject to heated debates, and they are also rejected by the Teachers' Union.)
The composition of the teaching staff in the institution in question (Budapest Business School, College of International Management and Business – BGF KKK) is also relevant to our theme; it is summed up in the following table:

	2008	2009	2010
Holds academic degree	32%	36%	37%
30 years old or younger	4%	3%	2%
31-45 years old	30%	35%	39%
46-54 years old	21%	20%	17%
55-62 years old	33%	30%	31%
older than 62	12%	14%	14%

Table 1: Age of instructors and proportion of instructors holding an academic degree
(Source: Supplements No. 4.1 of the yearly reports of BGF KKK for 2008, 2009 and 2010)

The table shows that similarly to other universities and colleges, the age group in which the educational activities were definitely not accompanied by the use of computers from the beginning is represented at around 62-66%. They were the ones from whom the appearance of web technologies demanded the greatest shift in attitudes and equipment use. Their age, on the other hand, may also give rise to certain concerns regarding the issue of replacement.

Students

We do not doubt that our students are open to everything new, although we sometimes get a distressing picture of their motivation and diligence. For example, it is not clear why they try to catch up with a whole semester's study during the 1-2 days before the exams instead of continuous learning. (This is what we can conclude from teachers' accounts, our own teaching experiences and, as we shall see later, the course statistics available in the framework system. See also Kriskó, 2011 on this topic) It is not clear why they claim that they are not familiar with the framework system, wen it is built up of tools and modules they already know from other computer applications.

Participants of the study were groups of first year full time students of international management, commerce and marketing. Most of them were first degree students who took the given course for the first time. There was a total of 6 seminar groups with some 30 students each. Due to the limited length of the present paper, I will concentrate on the business communication course of the international management program in this lecture, and will only present data from the commerce and marketing program as a basis of comparison where this seems relevant.

The Business Communication Course

The subject taught is business communication, which consists of a theoretical lecture series and a seminar course. Both the practical and the theoretical courses take place in two hours biweekly. (The teacher of the theoretical subject and the seminars is not necessarily the same person.) The aim of the subject is to acquaint students with the basic know-how and knacks with which they will be able to communicate adequately in the wide-ranging field of business life.

To this end, all we need to do is involve students in communication, in the traditional as well as in the virtual classroom. If we take the interactive view of communication (namely, that it proceeds towards something and has a definite end, and every participant has to make an effort in order to achieve the common goal) as a starting point, we can witness a fortunate encounter of the subject and the method under the aegis of web2.0. The primary aim of the course is to convey to the students the message that „[…] in order to profit more from the knowledge base of a community, first of all you have to be an active participant of the community in question." „[…] the more you read and write, share and communicate, the more the opportunities that are close to you will find you." (Kulcsár, 2008, no page number)

Interactivity in terms of communication

To stay on the field of communication, my courses can probably be most easily described in Newcomb's interactive model (Newcomb, 1966), as communicative acts in which we communicate as A (teacher) and B (students) about X (communication, business communication), and we mutually orient to each other and the topic (X) as well. In the system of group exercises, all this means that students produce and experience the same communicative acts within the groups, and the group exercise will be the reflection of some state of balance within the group. Their solutions will reflect that they acquire knowledge about each other during the work, and also about X (communication) and other Bs (who assume the roles of A' or A'B in the new models), and their attitudes towards the Bs and X also change. All this results in a multiple coorientation network, and leads to what the literature defines as networked learning. The latter is a process in which the informal, networked exchange of information supported by electronic facilities (LCMSs) dominates, and which turns learning into a networked process, where the students also learn from their peers. (Bessenyei, 2007)

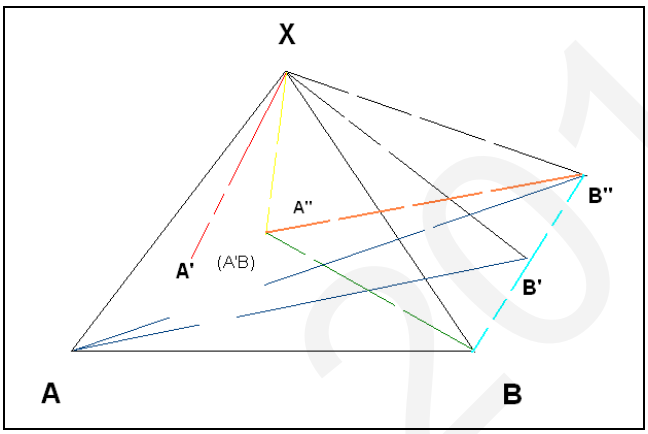

Figure 1: The extension of Newcomb' model for communication during a course
(image created by the author)

As a teacher, I aim to focus on what I can add to this, so that the Bs develop positive attitudes with respect to X (communication), and aim to incite them for further study, even if this will not be manifested right there and then or during the course, only years later in their professional practice. If being open to others and being oriented on a subject together happens at a sie like the LCMS, the returns are twofold. It leads us to a site which is not included in classical business communication textbooks as yet, the systematic analysis of which is ongoing, and the experience has the power to increase the credit of group communication, group thinking and Web 2.0. All of this is implemented with a method that employs the current paraphernalia of business life, and integrates them in the learning process. Thus blogs, the e-portfolio, the time band, the message board and all the other applications help update our whole set of business communication tools (up to the point of video conferences).

To all those who ask about the areas of pedagogy and IT, I would say that I am thinking in terms of the first step of connectivism. My attempts aim to make the Internet and virtual spaces part of our everyday lives, sometimes even against institutional powers that withhold us, and to find a place for group work that is not subject to simultaneous physical presence among our acts of communication and our sites, while our theme is business communication all the time.

Reasons for using Moodle

The framework system developed in New Zealand is fairly widespread worldwide, and has been one of the most popular in Hungary, too for several years. (There are 50519 registered Moodle pages in 211 countries and 266 in Hungary - http://moodle.org/sites/, download: 03.21.2010. 13:46h) „Moodle is an open source program package that enables the complex implementation of learning and teaching by the provision of a learning environment." (http://docs.moodle.org/hu/A_Moodle) It is practically an LMS also equipped with Web2.0 applications.

It was introduced at the BGF KKK in the year 2009 as a pilot project, upon the initiative of technical language instructors. The first users were the staff of the German language department, who primarily used it to publish language placement tests. The use of functions supporting learning, editing curricula

and group work has become prevalent by now, but the faculty is still in the phase of the initial steps. The system has 5163 users and 33 courses are available, which is a significant number if we consider the fact that the faculty does not offer distance education. However, the high number of users is misleading in that every active student of the department has been given a user account, but not everyone has an active course to take as yet, due to the small number of courses. For the time being, there is no full scale course management within the system.

Business Communication subject curriculum

In the following section I present the structure of the business communication course provided in the programs of commerce and marketing and international management. The subject has different contents in these two programs, one reason for which is administrative: the two subjects are managed by different departments (Department of Applied Communication and Department of Social Communication), and, on the other hand, the programs situate the subject in different curricular networks. Therefore in the following section I present the teacher's conception and the first results (not analysed in detail so far) through the course offered to students of international studies.

The major themes are: 1.) Organisational culture and behavior, 2.) Job application, CV, interview 3.) Internal communication, negotiation, meeting, 4.) Written communication, writing tools, 5.) Decision making in a group 5.) Organisational communication, mass communication.

Students engage in group work throughout the semester, and are given written assignments to be submitted at the end of each class. After the first three group exercises – that is, after six weeks' time – they receive a written evaluation of their performance through Moodle, broken down by the individual chapters of the curriculum. On the last occasion, they give group presentations of their work during the semester.

Curriculum elements in the Business Communication course

In the case of the seminar, there was no traditional, paper based material among the compulsory readings. A textbook available in electronic form was included (Béla Buda: *A közvetlen emberi kommunikáció szabályszerűségei*), and a Power Point summary (based on different textbooks) was compiled for each topic. References were included on the slides in each topic to encourage participants for further research and reading. Any aids that offer specific guidance or secure subsequent control for elaborating the group exercises during class are available as a website in Moodle. In addition to the above, test questions and a mini self-check (10-question true or false) test offer support to preparation, and a teachers' blog has also been avilable since spring. Students have been informed about the existence of the former in a message sent through the Neptun system in each course, and its availability has also been demonstrated during class.

The blog has a double function: on one hand, it enables the presentation and sharing of spontaneous assignments during class, which are based on relevant current events of public life (Fukusima and the nuclear emergency, or what are the major principles of crisis communication), on the other hand, assignments are offered for marks, in order to help students apply what they have learned in real life situations. (What is the difference between a statement made in a live radio program by an executive of the Hungarian Television on the program policies of the channel, and the same person publishing preliminary plans ahead of time in his professional blog, and this leads to dismissal? Does the director of the Festival Orchesrta criticise the work of the government in an interview given to a foreign paper as a private person?) It would be important to develop critical thinking in students.

Among the above elements, it was the blog from which I was expecting a breakthrough, because it was the one that secured the widest frames for the study of communication phenomena and the initiation of dialogues. Theoretical considerations can be made more colourful by multimedia elements, and as this ensures a more informal tone, humour and irony also have a place here. Individual themes are meant to illustrate that what we talk about during the sessions is very human, everyday, subjective, manipulable, and any related knowledge can be used to our own ends.

Experiences in the Business Communication course of autumn 2010/11

The following diagram is meant to demonstrate that most students only entered the course on the eve of the final test of the semester, and this was when they reviewed the material and aids uploaded there or read the detailed description of requirements or skimmed through the compulsory and recommended reading list. One might say that there was no activity in the Moodle course before that. 8 students from the 30-member group did not visit the Moodle course at all. The average time spent in the system was 10.4 minutes. The attendance sessions also resembled lectures rather than seminars. It was difficult to

initiate dialogue, there were no questions that catalysed the debate. There was not a single forum comment or response (except for the teacher's comments on the requirements, recommended literature, links and other relevant issues). Not one student began to compile an e-portfolio, and not one participant of the course started a blog.
This was when the idea of group work was raised, and the necessity of active tutoring was admitted. This gave rise to the rethinking of the whole conception, aiming to generate active participation by students through the combination of the interactive view and Web2.0.

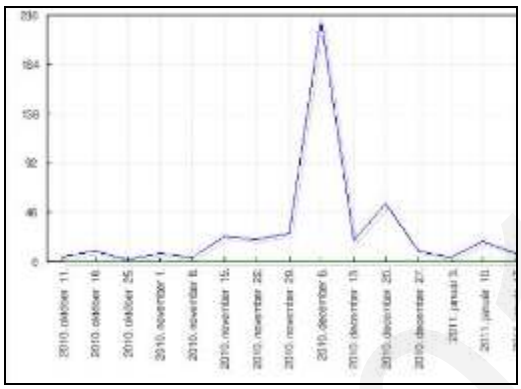

Figure 2: Student activity in the autumn course
(Source: http://moodle.kkfk.bgf.hu/)

Experiences in the Business Communication course of spring 2010/11
The academic year is still on at the time of writing, 3 weeks are left from the term time, but the available data already point to some progress towards dialogue-based work. As opposed to the previous semester, more than half of the students logged in to the system and entered the course after the first contact hour. The rate of viewing each element of the curriculum varies widely between 12 and 90%. The only item visited frequently in every course is the Job search and Job Interview Encyclopedia created in a Wiki format (a visiting rate of 180% with respect to active course members).
The first steps of the realisation of the teacher's intention are seen in the G7 group (top right diagram of Figure3), with a continuous activity around 20. (Unfortunately, this also reflects the extent of student interest experienced at the attendance sessions.) As a comparison: attendance at the course varies around 3 and 5 per cent in the marketing program.

Figure 3: The activity of the 3 spring groups (G5, G6, G7)
(Source: http://moodle.kkfk.bgf.hu/)

However, the number of views for course elements was 1.5-2 times higher than it was in the previous semester, calculated for the corresponding period of time. This is most striking in group G6. The average amount of time spent in the system is expected to be as high as 20 minutes/person – due to the fact that students still only use Moodle for downloading course material most of the time
It remains a question whether stronger and more compulsive methods should be used for promoting the use of electronic facilities (e.g. compulsory exercises to be submitted through the framework system, on a weekly or be-weekly basis), as the amount of course material required in this subject is small. It would be much more important to see interpersonal dynamics, processes and states in practice, and to get to know students' own set of communication tools in vivo and extend them to web-based tools that also enable group work from the distance.

Summary

We have found data (course journals and personal activity lists) supporting the finding that we hold our classes to 4-6 students per group, which is reinforced by the personal feedback by other teachers on their experiences at attendance sessions. Naturally, this is enough to generate tractive force in each group, but does not secure permanent participation by each course member. A positive reading could be that students have first-hand experience of the difficulty of work organisation, and face the burden that slackers constitute, as well as the difficulties of motivation and engagement, but the concerns we are faced with in the phase of evaluation are twofold. It is difficult to separate the reward of work inside and outside the classroom if we evaluate the work itslef and not the process. If the submitted work is evaluated favourably thanks to the most diligent and most apt group members, everyone can equally take part in the success. This is realistic, but it will cause a tension between aptitude in the subject and the mark received in many cases.
There are, however, some positive returns as well. The atmosphere of the attendance sessions and the standards of the submitted works have improved, the jointly prepared assignments are more professionally adequate and comprehensive than individual students' works have been or used to be. Students have learned to think in a group, and as a result of the themes discussed, they are more reflexive on their participation and the biases within the group. Also, more questions are raised at the attendance sessions. Apart from a few exceptions, if a group member misses a meeting, he or she asks for an extra assignment, so they will not make the impression of taking a smaller part in the group work.
In sum, we can say that this chosen track has made the subject that students had been averse to more popular, it initiated a dialogue, and finally created a distance from the teacher's style at the attendance sessions and made them more like an event of joint thinking characterising seminar work. Even if at a less profound level, they acquired some experience on the operation of framework systems, and gained an insight into the view of electronic learning and teaching, which has been gaining ground extensively. They have approached Facebook more consciusly as a site of communication, as a tool for self-management and civil will formation. This is a good preparation for their studies in (online) marketing next year.

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The Development Model of Knowledge Management Via Web-Based Learning to Enhance Pre-Service Teacher's Competency

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Abstract: This research explores that the model of knowledge management and web technology for teachers' professional development as well as its impact in the classroom on learning and teaching, especially in pre-service teacher's competency and practices that refer to knowledge creating, analyzing, nurturing, disseminating, and optimizing process as part of the learning quality improvements. In this process, web technology particular web-based learning has a necessary role to drive and integrate knowledge and learning activities within the knowledge management process (I-Can do model). In this respect, this research aims to study and develop the appropriate model of knowledge management via web-based learning by the 18 expert's consensus and evaluate competency of the 64 pre-service teachers that divide and random assignment into 2 equal groups (control and experimental group). The competency assessment tools are conducted the volunteer participants' competency particularly in knowledge, attitude, and skills approach. The research results exhibited that the model of knowledge management via web-based learning was appropriated and enhanced the pre-service teacher's competency.

Keywords: Knowledge Management (KM), Web-based learning (WBL), Competency.

Introduction

Teacher quality is the top contributing factor to student achievement. Quality ongoing professional development contributes to teacher growth and success. The need for professional development that can meet today's educators' demanding schedules, that uses quality content and resources that are available to teachers from any place and any time, and that can deliver relevant, accessible, and ongoing support has stimulated the development of online teacher professional development programs. Online teacher professional development programs make it possible for educators to communicate, share knowledge and resources, and reflect via asynchronous interactions. Moreover, Chai (2010) suggest that the many current ICT-supported reform efforts demand teachers to assume the role of epistemic facilitator of knowledge construction supported by technology. In addition, Koc and Bakir (2010) explored the characteristics of such technology training programs were discussed to help pre-service teachers learn how to use technologies as instructional tools to enhance their teaching and students` learning. The condition of education in Thailand today still has several problems. Especially, the quality of teachers seems shortages (Secretariat of the Council of Education, 2010: 53). Along with the lack of pedagogy training that is not match in the actual practical needs for schools (Keawdang, 2009: 131). Likewise, the competency problems effect on operations of teachers and learners (Ratchatavipasnant, 2009). Particularly, the lack of the good knowledge management let the opportunity to

exchange and share knowledge is decreased between them and focuses on the upstream of training from real situations process (Dejakoop and Khangkhan, 2008) furthermore, Lee, et al (2010) have suggests that the common difficulties and limitations regarding the implementation of knowledge management into schools' organizational cultures are reviewed and discussed. In addition, Erkunt (2010) exhibited that students' collective inquiry relied on socially distributed cognitive resources that were generated by their social interactions in class and online using technology. The concept of web-based learning that based on the appropriate tool and the medium to deliver knowledge, and helps learners can communicated with each other (Catherall, 2008) especially in teaching and learning using the potential of internet network to access with various sources of learning (Speranza, 2008). The main purpose of this study is to research and develop activities to be appropriate with the learners that integrated with the concept of knowledge management and web technology. The question then becomes, "How to develop the appropriate model of knowledge management via web-based learning to enhance pre-service teacher's competency". The expected benefits are the appropriate model that is the systematic approach to enhance pre-service teacher's training. More over the results of quality assessment of model that is body of knowledge to develop the pre-service teacher's curriculum. In addition the results of pre-service teacher's competency assessment by using the knowledge management model via web-based learning that are information to support the educational systems policy maker.

The Study

The first phase: Studying the model of knowledge management via web-based learning to enhance pre-service teacher's competency.

1. Analyzing the elements of knowledge management (KM) are included the knowledge management activities: Creating (Explore and Capture), Analyzing (Identify and Organize), Nurturing (Utilize and Demonstrate), Disseminating (Transfer and Diffuse), and Optimizing (Evaluate and Improve)

2. Analyzing the elements of web-based learning (WBL) are included the elements of web-based learning (instruction, interaction, and internet) and web technology (collaboration, communication, and storage technology).

3. Analyzing the elements of competency (Knowledge, Attitude, and Skill approach).

4. Integrating the elements of knowledge management, web-based learning and competency.

The second phase: Developing the model of knowledge management via web-based learning to enhance pre-service teacher's competency and competency assessment tools.

1. Developing the model of knowledge management via web-based learning.

2. Developing the competency assessment tools that include the achievement test, attitude test, and performance test.

3. Developing the efficacy of the model of knowledge management via web-based learning to enhance pre-service teacher's competency.

The third phase: Evaluating the model of knowledge management via web-based learning to enhance pre-service teacher's competency.

1. Research design by following the Two-Group Posttest Only Design.

2. Population and samples:

2.1 Population are the first year pre-service teachers who study in 2ndsemester, 2010 academic year at faculty of Education, Chandrakasem Rajabhat University, Thailand.

2.2 Samples are random sampling the 64 pre-service teachers that divided into 2 groups: The first group is 32 peoples for experimental group and the other group is 32 peoples for control group.

3. Research tools:

3.1 The model of knowledge management via web-based learning.

3.2 The competency assessment tools (knowledge test, attitude test, and performance test).

4. Data analysis:

4.1 Descriptive statistics ($\bar{x}$ and S.D.) are used to describe the basic features of the data.

4.2 Inferential statistics (t-test with independent sample) are used to compare the data between control and experimental group.

Findings

1. The model of knowledge management via web-based learning to enhance pre-service teacher's competency — I-Cando model was appropriated with the 18 expert's consensus.

1.1 Input step: comprise that the elements of web-based learning (Instruction, Interaction, and Internet: I^3) and web technology (1.Collaboration technology: Wikis, Blogs, Forum, Peer review. 2. Communication technology: Skype, Presenter, Twitter, SLOODLE. 3. Storage technology: YouTube, Data mining, Mind Map) — I^3 - WBL (Figure 1)

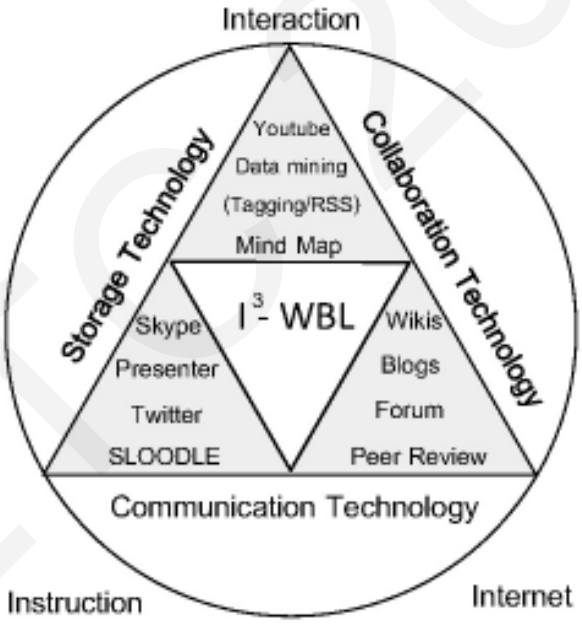

Figure 1: The elements of web-based learning and web technology— I^3 – WBL

1.2 Process step: comprise that the elements of knowledge management (KM) are include the knowledge management activities: Creating (Explore and Capture) is driven by Benchmarking: B_1 activity, Analyzing (Identify and Organize) is driven by Communities of Interest: C_1 activity, Nurturing (Utilize and Demonstrate) is driven by After Action Review: A-A-R activity, Disseminating (Transfer and Diffuse) is driven by Communities of Practice: C_2 activity, and Optimizing (Evaluate and Improve) is driven by Best Practice: B_2 activity — I-Can do model (Figure 2).

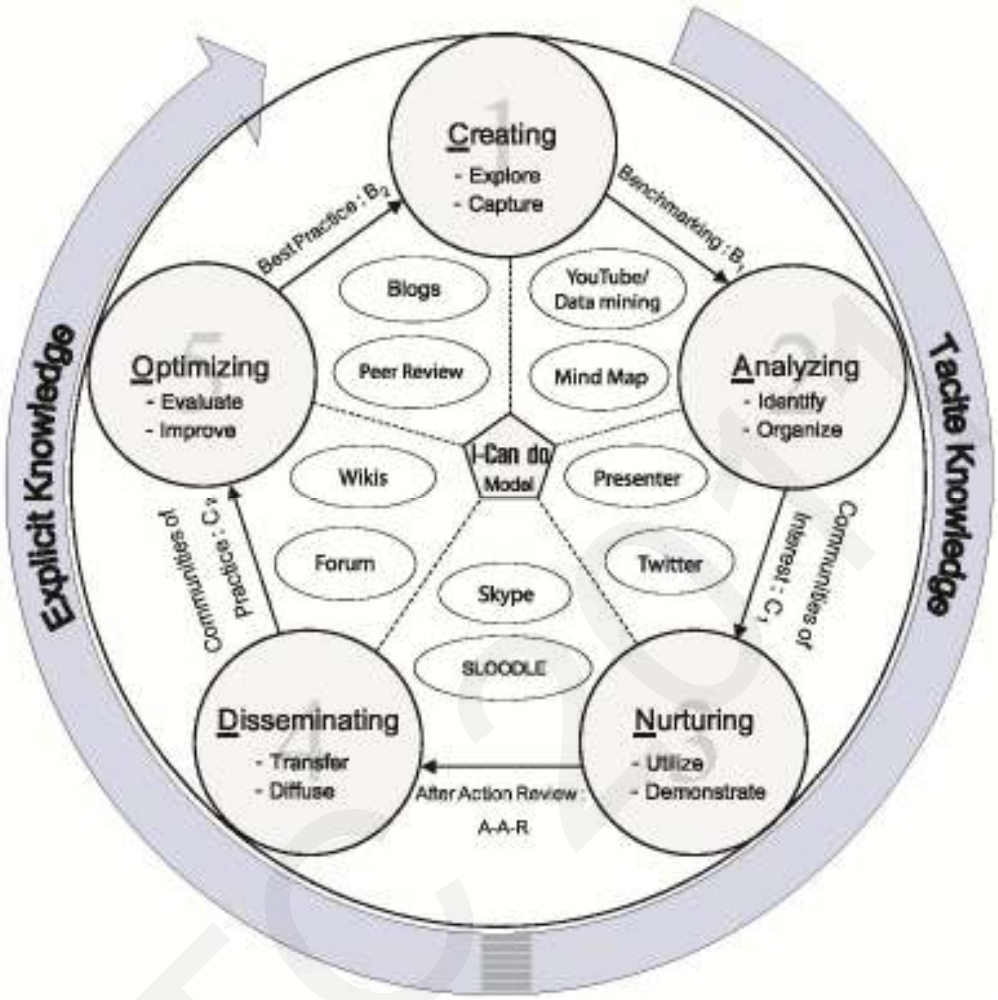

Figure 2: The elements of knowledge management process— I-Can do model

1.3 Output step: comprise that the elements of competency (Knowledge, Attitude, and Skill— KAS approach) and evaluate by Knowledge, Attitude, and Performance assessment (Figure 3).

Figure 3: The elements of competency— KAS approach

2. The efficacy of knowledge management via web-based learning model was appropriated with the volunteer participants' competency (E1 / E2 = 86.23/85.33) that accord with the efficacy criteria of web-based learning (85/ 85 Standard) (Brahmawong, 2002; Whattananarong, 2004) (Table 2).

volunteer participants (n=30)	**Formative efficacy evaluation: E_1 score = (40)**	**Summative efficacy evaluation: E_2 score = (40)**
1	25	24
2	26	26
3	27	25
4	24	24
5	25	23
6	26	26
7	28	27
8	25	25
9	27	26
10	24	23
11	25	25
12	24	26
13	25	24
14	26	26
15	25	25
16	28	28
17	26	25
18	27	26
19	25	24
20	28	27
21	27	28
22	26	25
23	25	26
24	27	27
25	26	26
26	24	24
27	25	26
28	27	29
29	28	28
30	25	24
$(\sum X)$	776	768
$\bar{x}$	25.87	25.60
E1 / E2	$E_1 = \frac{\frac{\sum X}{n}}{A} \times 100 = \frac{25.87}{30} \times 100 = 86.23$	$E_2 = \frac{\frac{\sum X}{n}}{B} \times 100 = \frac{25.60}{30} \times 100 = 85.33$

Table 2: The efficacy of knowledge management via web-based learning model

3. The model of knowledge management via web-based learning was enhanced the pre-service teacher's competency (Knowledge, Attitude, and Skill assessment). The research findings revealed that the

competency of pre-service teacher exhibited the experimental groups was high competency than control group at the 0.05 level of significance (Table 3).

Competency	Group	n	$\bar{x}$	S.D.	t	p
Knowledge	Experiment	32	23.09	2.59	4.47	.000
	Control	32	20.44	2.13		
Attitude	Experiment	32	4.01	0.26	8.07	.000
	Control	32	3.48	0.27		
Skill	Experiment	32	16.44	1.05	6.89	.000
	Control	32	14.53	1.16		

$p < .05$

Table 3: Comparison of competency assessment (control and experimental group)

Conclusions

The research results exhibited that the model of knowledge management via web-based learning was appropriated and enhanced the pre-service teacher's competency. Norbert Pachler, et al (2010) have suggests that teachers' participation in online communities exists in complex interrelationship with other learning practices, only some of which use technology. Collaborative professional development involves the use of technologies for the sharing of experiences and artifacts within and across schools as a basis for critical reflection on pedagogy. Developing and sustaining an effective online learning community can be challenging even in the midst of an era of much technological advancement. More over developing and sustaining an effective large-scale online community is even more challenging. As online teacher professional development is an emerging trend it is still a "new frontier." Educators around the world experience many demands on their knowledge, time, and professional development (Zygouris-Coe and Swan, 2010). In addition, professional development has mainly centered on training processes that involve updating knowledge, yet it has made little headway as a construct that includes both the professional and personal characteristics and working conditions. It has also focused more on developing training program than on analyzing the tools for continuous training (Gairín-Sallán and Rodríguez-Gómez, 2010). Finally, online learning technologies have the potential to transform the professional development of teachers; penetrate cultural, discipline, and other barriers; bring educators together to learn, share successes and challenges; and co-construct and transfer learning.

Acknowledgement

This research was funded by the Graduate school, Kasetsart University, Thailand.

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THE DEVELOPMENT OF A WEB-BASED SELF-REFLECTIVE LEARNING SYSTEM FOR TECHNOLOGICAL EDUCATION

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ABSTRACT

One obstacle to industrial technology education is that the difficulties or problems students encounter during experiments are not easy to detect. Students are often unaware of their flaws, and some will not notify the teacher of these flaws even if they are aware of them. Consequently, many opportunities to rectify these flaws and improve teaching methods are lost, and students who are falling behind are deprived of instant guidance and cannot catch up. Therefore, this paper aims to develop a web-based self-reflective learning system to enhance students' learning of industrial technology.

This study applied sensor network technology to develop a web-based self-reflective learning system based on a self-reflective learning approach. The system was integrated into a MEMS technology course for empirical study. Subsequently, the influence of the web-based self-reflective learning system on students' learning performance and technical skills was investigated. Analysis of the data obtained from learning cognition, skill assessment, and learning satisfaction following education indicated that the web-based self-reflective learning system could effectively improve the learning performance of students falling behind, thereby allowing these students to catch up in their cognitive and skill achievements by the end of the semester.

INTRODUCTION

Dewey (1933) was the first scholar to propose the concept of reflection, which he defined as the behavior of repeated thinking and searching upon encountering problems; combined with observations of the surrounding environment, understanding of the causal relationship stimulates deeper thinking. Kemmis (1985) believed that reflection was a process of internal and external dialectics. Through reflection, individuals can increase comprehension of their own thinking process. Reflection is a psychological activity that extracts and forms meaning from experience, which contributes to reorganizing and restructuring perceptions. This further enables gained knowledge to become refined and differentiated gradually. Consequently, this study considers reflection distinctive from thinking. Reflection is the process of integrating experience or past perception with newly received perspectives before further internalization into personal knowledge. Therefore, reflection is thinking with the additional components of reflection and action. Paris and Ayres (1994) pointed out that reflective thinking motivates students to learn; applying strategies to accomplish specific objectives is very useful. Reflection may occur before or after the action, which indicates that personal knowledge is progressively formulated during actual working action. Regarding the relationship between personal action and reflection, Elliott (1991) stated that reflection originates from action, which suggests that reflection is generated from collected information during personal action. From a teaching perspective, Schon (1983) divided reflection into two major frameworks: reflection-on-action and reflection-in-action. Reflection-on-action indicates that reflection occurs in the interval after teaching and before planning and thinking. Reflection-in-action is an attempt to adjust personal teaching and deal with responses during the process of teaching. Carver and Scheier (1998) identified self-reflection as individual survey, evaluation, and comprehension of personal thoughts, feelings, behavior, and self-awareness. Davis (2000) requested learners perform self-reflection during the process of learning; the action of reflection allowed the learners to re-survey, test, and modify existing thoughts and knowledge, which further achieved improved and more structured comprehension. Costa and Kallick (2000) believed that students who could conduct self-reflection were more able to gain cognitive structure among teachers and classmates as they had a clearer understanding of their own steps in reasoning.

Paris and Ayres (1994) suggested that applying learning portfolios and authentic assessment could effectively induce reflective learning. The creation of learning portfolios is a continuous process from the beginning to the end of the learning activity. Prior portfolios can provide learners with a reference for

reflection, allowing the learners to focus their reflection on the learning objectives. This approach is more effective and directional. E-portfolios are primarily a development of traditional portfolios, and only secondarily result from the process of digitizing; data that are collected, stored, and managed digitally before being placed on webpages are called web-based portfolios. The main functions of the web-based student portfolio system developed by Younes (2004) were storage, display, and reflection of students' learning processes from admission to graduation. In the structured web-based portfolio assessment system established by Chang (2008), one of the functions was composition and assessment of reflection. This system provided students with a reflection outline for them to compose their reflections; the teacher assessed the compositions and responded with feedback. Students could assess their own reflections as well as assess and give feedback on the reflections of their peers. E-portfolios assist students in evaluating their own learning processes and performing reflections (Liu, E. Z. F., 2010, and Chang, C. S., et al., 2011). Through having the students observe and emulate each other, mutual understanding among peers is increased along with the opportunity for learning competition; teachers are thereby aided in observing the learning circumstances of the students and can assess accordingly. However, how to combine modern technology and construct a web-based learning system based on a self-reflective learning approach to enhance learning performance is an issue requiring further research.

With recent advances in micro-electro-mechanical systems (MEMS) and wireless communication technologies, wireless sensor networks have emerged from laboratories to be used everywhere, changing our future lives. Wireless sensor networks are more attractive and useful than traditional wired sensing systems due to their ad-hoc and easy deployment. This new technology expands our sensing capabilities by connecting the physical world to communication networks and enabling a broad range of applications (Akyildiz, Su, Sankarasubramaniam, and Cayirci, 2002). Sensor networks are the integration of sensor techniques, distributed computation, and wireless communication techniques, and can be embedded in our physical environment and used for sensing, collecting data, processing information of monitored objects, and transferring the processed information to users. The sensor node's hardware consists of five components: sensing hardware, processor, memory, power supply, and transceiver (Tubaishat and Madria, 2003). For numerous applications, a sensor network operates in three phases. In the first phase, sensors take measurements that form a snapshot of the signal field at a particular time, and these measurements are stored locally. The second phase is information retrieval, during which data are collected from individual sensors. The last phase is information processing, during which data from sensors are processed centrally with a specific performance metric (Dong, et. al, 2007, and Shyr, 2011). Such a network is composed of numerous tiny low-power nodes, each consisting of actuators, sensing devices, and a wireless transceiver. These sensor nodes are deployed in significant numbers in a region of interest to gather and process environmental information.

WEB-BASED SELF-REFLECTIVE LEARNING SYSTEM

The new technology of a wireless sensor network expands sensing capabilities by connecting the physical world to the communication networks. To support learning in MEMS technology, numerous sensor devices must be deployed in the laboratory to collect real-time information of students' motions and machine operation conditions. This study used the Zigbee modules to build a wireless sensor network. The proposed architecture of the sensor network system is shown in Figure 1. The overall system architecture comprises a Web camera, a Zigbee dongle (base node), a server, and wireless sensor nodes. The wireless sensor nodes consist of two key parts referred to as the static and the mobile nodes. The static sensor nodes are scattered in the laboratory, forming a multi-hop mesh networking topology. One key role of the static node is to transfer all the data packets from the mobile node to the dongle. The static node's other key role is to provide sufficient anchor points for the localization. Each sensor nodes is capable of collecting data and routing data peer-to-peer to the Zigbee dongle. The Zigbee dongle is used to bridge the sensor network to the Internet, and provides a serial interface and wireless connection for node programming and data transfer. The server is connected to the Internet to enable remote users to access the laboratory monitoring system. The mobile node, comprising an accelerometer worn by students, is for monitoring student motion and position in an indoor environment.

During experiments and practice, students need to rotate handle by hands while operating machines and adjusting machining parameters. Some machines also require students to pedal using their feet to adjust machining parameters. Therefore, this study intends to incorporate ultra-thin force sensing units (0.127mm) into the Zigbee node, make flexible force sensors, and install handles and pedals. To ensure students are able to use the tools correctly, training during experiments and practice is necessary. Therefore, this study plans to connect the Zigbee node with the PIR325 infrared sensing unit to make a wireless infrared sensor, which will then be installed in the toolbox. This study connects a Zigbee node

with a three-axis micro electro-mechanical system (MEMS)-based accelerometer to make a wireless accelerometer. An accelerometer is a device that measures acceleration, and detects the acceleration magnitude and direction as a vector quantity. The sensor is worn by a student, and not only detects and records the student's position inside the laboratory, but also senses their movements.

A graphical user interface (GUI) enabled remote users to carry out the desired operations, such as sending commands and parameters to drive the sensor nodes, and visualizing the measurement results. This thesis used ASP.NET and Microsoft Visual C# to write an internet program that enabled quick and convenient information processing. Figure 2 displays the Web GUI of a user monitors the laboratory environment at the remote client side. By clicking on the mouse, a remote user is able to adjust the camera's viewing angle to acquire video data. This interface accepts remote client-side to acquire information on which node to monitor though clicking the buttons and checkboxes on the panels. Upon clicking the sensor installed on the node, the sensors' signal can be observed. The data from selected sensors are collected and sent to the Web GUI at specific time intervals. In Figure 3, the top-left corner displays the information measured by the force sensor at various intervals, while the bottom-left corner displays the force sensor's instant information. Additionally, the top-right corner displays information measured by the IR sensor at various intervals, while the bottom-left corner shows the student's current position in the laboratory.

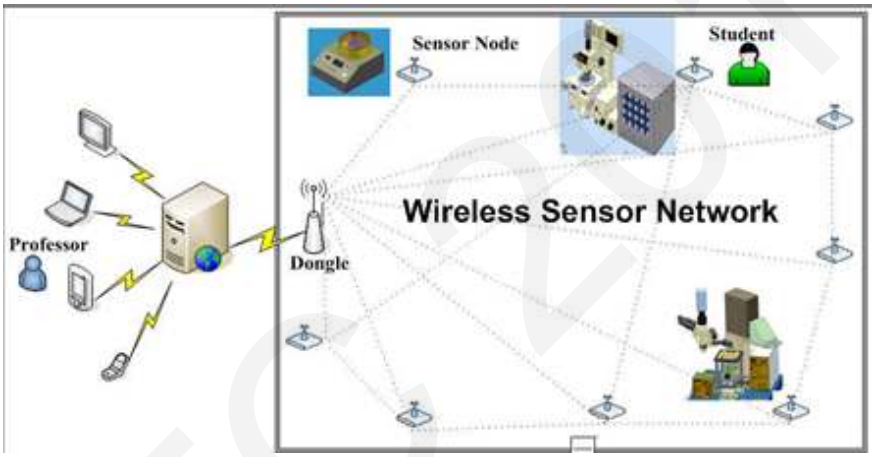

Figure 1. Architecture of the wireless sensor network system

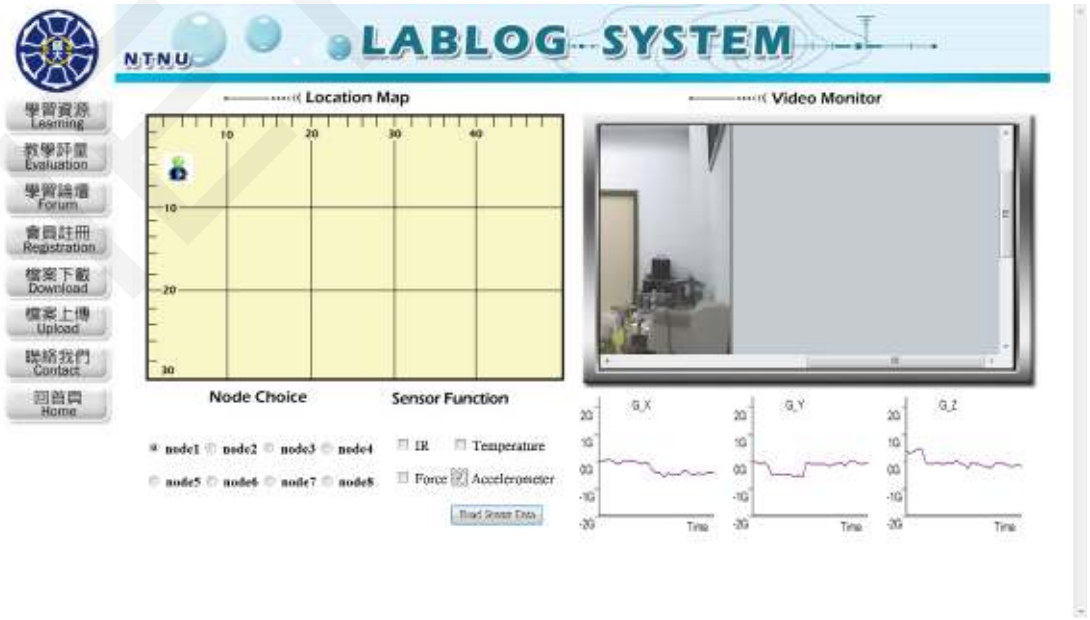

Figure 2. GUI of the wireless sensor network system at the remote client side

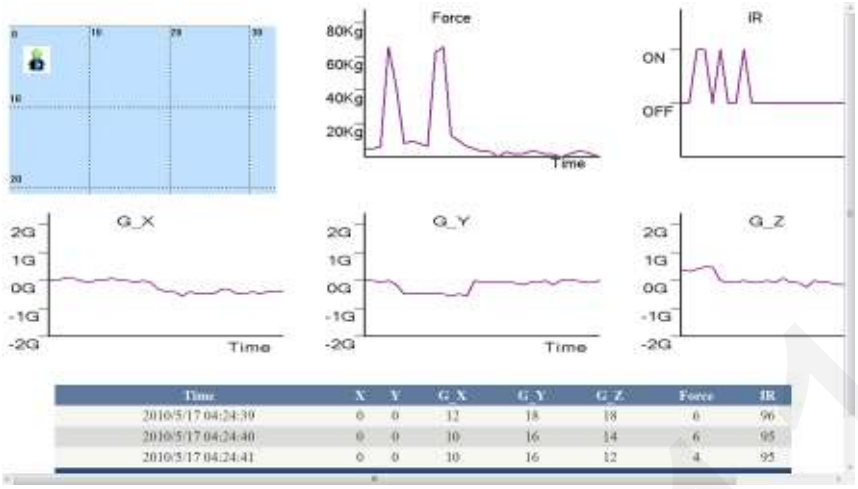

Figure 3. Real time monitoring of force and IR sensors at the remote client side

RESEARCH PURPOSE

The objectives of this study consist of the following:

1. Investigating the influence of a web-based self-reflective learning system on student learning performance and technical MEMS Technology skills.
2. Investigating the influence of a web-based self-reflective learning system on student satisfaction of MEMS Technology learning activities.

Based on the preceding research motives and research purposes, this study formulated the following hypotheses:

Research Hypothesis 1-1: Students' MEMS Technology cognitive aptitude test scores before and after experiencing the web-based self-reflective learning system demonstrate no significant difference.

Research Hypothesis 1-2: The MEMS Technology technical skills test scores from different raters after implementation of the web-based self-reflective learning system show no significant difference.

RESEARCH METHODS AND INSTRUMENTS

The study population comprised students taking courses in MEMS technology; the sample size was 54 students. The curriculum contained a series of formal lectures and laboratory experience. Besides the fundamental scientific and technology subjects presented in the classroom, the students were required to complete practical work based on problem-based learning (PBL) approaches. The practical work aimed to increase the theoretical understanding of subjects and the development of practical micro-fabrication and micro-packaging skills.

The experimental tools used during this study include a Cognitive Aptitude Test, a Learning Satisfaction Survey, and a Technical Skills Indicator. Following revision and correction, the Cognitive Aptitude Test had 50 multiple-choice questions. The passing mean and discrimination percentage were 0.58 and 0.35, respectively, demonstrating it to be a reasonable test with a good passing and discrimination percentage. According to reliability analysis, the Cronbach's alpha value of internal consistency was 0.786. Moreover, the criterion validity was based on a significant positive correlation between the semiconductor assembly and packaging test scores of several comprehensive and technological universities. As a result, the cognitive aptitude test had good reliability and validity.

In addition, the satisfaction survey for this study was based upon a Likert-type five-measurement scale. Using a pre-test satisfaction survey, this study had participants answer questions regarding observations and thoughts, and then analyzed each question's effectiveness and reliability according to the received result. Following evaluation of the survey's effectiveness and reliability, the questions were carefully revised and edited to produce the final and official questionnaire.

To understand the technical skills of students, this research developed a technical skills indicator based on E. J. Simpson's Seven Levels of Taxonomy. To avoid subjective judgment, the researchers together with the teaching assistants monitored and evaluated the testing groups during the exam. Upon

reviewing the results using Spearman's Rho rank order correlation, the correlation coefficient was 0.889, indicating that the researchers' and teaching assistants' evaluations were consistent.

DATA COLLECTION AND DISCUSSION

The data collected in this study include the scores from the two cognitive aptitude tests, the learning satisfaction questionnaires of technical activities, and the technical skills tests. The adopted methods for statistical analysis were mean, standard deviation, and a t-test, conducted using SPSS12.0.

This study examined the relations between pre-course cognition, post-course cognition, satisfaction, and the technical skills test. Pearson's correlation coefficient was applied to investigate the correlation and strength among the variables. As shown in Table 1, significant linear correlation exists between pre-course cognition and post-course cognition (r = 0.812), between post-course cognition and the technical skills test (r = 0.320), between satisfaction and pre-course cognition (r = 0.657), and between satisfaction and post-course cognition (r = 0.604). The correlations are all positive, indicating that: pre-course cognition is proportionate to post-course cognition; higher scores in the technical skills test represent greater post-course cognition; and satisfaction is greater in students with higher pre-course cognition or post-course cognition.

Table 1. Summary of Correlation Analysis

Item	Pre-course Cognition	Post-course Cognition	Technical Skills Test
Pre-course Cognition			
Post-course Cognition	.812**		
Technical Skills Test	.137	.320*	
Satisfaction	-0.061	-0.151	-0.031

*p<.05; **p<.01

This study adopted an independent t-test to determine whether significant differences exist between students with higher and lower learning achievement. Students scoring in the top 27 % in pre-course cognition were in the high achievement group, while the bottom 27 % comprised the low achievement group, and the statistics from these two groups were compared. As exhibited in Table 2, a t-test presented significant difference (p<.05) between the high and low achievement groups in the pre-course cognition test, indicating a difference between the two groups in pre-course cognition. In post-course cognition, a t-test also showed significant difference (p<.05) between the two groups. In terms of progress, the difference between the two groups was also significant (p<.05); the margin of progress was greater in the low achievement group than in the high achievement group. The above results indicate that receiving web-based self-reflective learning causes the learning cognition of students to differ.

Table 2. Comparison of t-test Results for Pre-course Cognition of High and Low Achievement Groups

Group	Low Achievement Group (n = 16)		High Achievement Group (n = 18)		p	t
	Mean	SD	Mean	SD		
Pre-course Cognition	44.50	11.74	68.00	3.43	.000**	-7.72
Post-course Cognition	54.38	12.48	71.78	5.69	.000**	-5.12
Improvement Score	9.88	6.55	3.78	5.04	.004**	3.06

*p<.05; **<.01

Table 3 presents the t-test results for technical skills in the two groups of students. Excluding the perception and set constructs, the t-tests all reached significance (p<.05), indicating that considerable differences appeared in the technical skills test of both groups. The total score of the technical skills test was derived by summing up the mean number of times in the achieved items of each construct, and converting that sum to a percentage. Analysis revealed that the majority of the constructs reached significance (p<.05), indicating considerable differences in the technical skills of students in the high and low achievement groups upon receiving web-based self-reflective learning.

Table 3. U test Results for the Technical Skills Test Scores of High and Low Achievement Groups

Group	Low Achievement Group (n = 16)		High Achievement Group (n = 18)		*p*	*U*
	Mean	SD	Mean	SD		
Perception	2.00	0.00	2.00	0.00	1.000	352.0
Set	5.88	0.34	5.83	0.38	.081	291.0
Guided Response	7.25	2.08	8.06	1.63	.001**	175.0
Mechanism	12.94	3.21	13.67	3.36	.000**	149.5
Complex Overt Response	8.19	2.61	8.72	2.89	.022*	226.0
Adaptation	2.50	0.73	2.72	0.75	.000**	122.0
Origination	2.06	1.06	2.28	1.41	.049*	244.5
Total Score	62.19	11.71	64.86	12.73	.002**	174.5

*p<.05; **<.01

According to the data analysis shown in Table 3, a radar chart was created for the percentages converted from the sums of the mean number of times in the achieved items of each construct. Figure 4 exhibits the overall learning performance of both groups of students for each technical skill. Using weighted calculation, the mean comprehensive ability values were derived; these were 1.53 and 1.43 for the high and low achievement groups, respectively. As indicated by the values, the mean comprehensive abilities of both groups of students differ significantly after employing the web-based self-reflection learning system. This result corresponds with that of Table 3. The web-based self-reflection learning system effectively improves the learning performance of students falling behind, enabling these straggling students to catch up. Regarding satisfaction, a t-test revealed no significant differences (p>.05) in both groups as shown in Table 4.

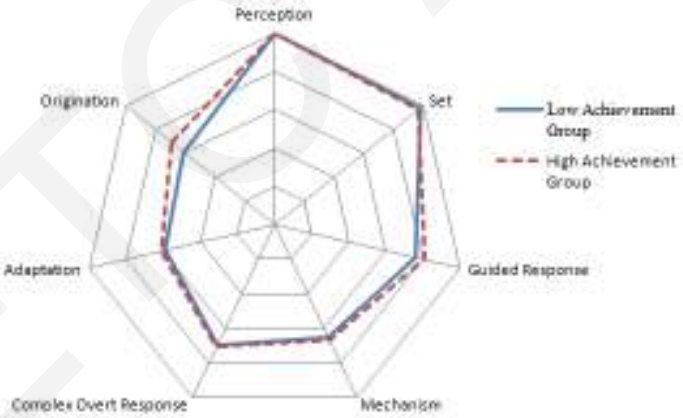

Figure 4. Comparison of Radar Charts for the Technical Skills of Students in the High and Low Achievement Groups

Table 4. T-test Results for Satisfaction of High and Low Achievement Groups

Group	Low Achievement Group (n = 16)		High Achievement Group (n = 18)		*p*	t
	Mean	SD	Mean	SD		
Satisfaction	4.14	0.59	4.24	0.57	0.623	-.497

*p<.05

STUDY LIMITATIONS

The sensors developed in this study were experimental. One study limitation was that the large sensor size reduced the wearabilty for students. However, this issue will be resolved with future progress in flexible electronics; sensors may become soft and small like a piece of cloth, which students will barely

notice when using. Another limitation of this study was that the precision of the sensor network system's indoor positioning was approximately one meter. Though this affected the positioning of students within the test room, it did not affect the sensing and measurement of data while students operated equipment.

CONCLUSIONS

Practical training is an important teaching strategy to improve students' industrial technology competence. To overcome the obstacles of traditional experiments and practical training courses, and to enhance current e-learning system functions, this study used sensor network technology as the foundation for developing a self-reflective learning system. This system presents the students' operational results immediately, thereby enabling appropriate guidance when students encounter problems during experiments and practical training. Moreover, this system can record students' learning processes during experiments and practical training, and this data used to identify students' learning difficulties. Even when practicing in a clean factory room, the teacher can be aware of the problems encountered by students during the practice process, using the system developed by this research. Therefore, teachers can appropriately guide students to avoid repeating mistakes. According to related data, a web-based self-reflective learning system can effectively improve the learning performance of students falling behind, enabling these struggling students to catch up by the end of the semester.

ACKNOWLEDGMENT

The authors gratefully acknowledge the support of this study by the National Science Council of Taiwan, under the Grant No. NSC 98-2511-S-003-017-MY2 and NSC99-2511-S-003-034-MY3

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THE EFFECT OF E-LEARNING BASED COMPUTER COURSE ON THE COMPUTER SELF-EFFICACY LEVELS OF PRE-SERVICE TEACHERS

İrfan Şimşek[1], Gamze İnan[2]

ABSTRACT

Self-efficacy is a motivational construct, which is used prevalently in educational psychology research. Computer self-efficacy is individuals' beliefs on their capability to use the computer. E- learning is defined as an extended notion that comprises all kinds of electronically supported learning and teaching processes. In the present study, the effectiveness of an e-learning based computer course on the computer self-efficacy scores of pre-service teachers is investigated in one group pre-test-post-test design. The sample of the study is composed of 48 first year undergraduate students of Elementary Mathematics Education Department at Hasan Ali Yücel Education Faculty in Istanbul University. According to the results of the study, the computer self-efficacy scores of pre-service teachers are significantly increased after they attended to the e-learning based computer course.

Keywords: Computer self-efficacy, pre-service teachers, e-learning

INTRODUCTION

Self-efficacy is a motivational construct that has been proposed by Bandura (1977, 1986) in the frame of Social Cognitive Theory. According to that theory, self-efficacy belief, being a core construct, is defined as "…beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments." (Bandura, 1997, p.3). Bandura (1986, 1997) states that self-efficacy belief has a determining effect on individuals' choices, effort, persistence and anxiety experienced in the face of challenging goals. Since Bandura has proposed it theoretically and empirically, self-efficacy has become a research subject in a wide range of studies from organizational psychology to clinical or educational psychology areas. According to Bandura (1997), Social Cognitive Theory defines individuals as proactive and self-regulating in terms of behavioral adaptation. This adaptation is established by the concept of reciprocal determinism, which defines human functioning in a dynamic interaction between environmental, behavioral, and personal influences (Bandura, 1997; Pajares, 2005; Moos and Azevedo, 2009).

Recently, depending on the advancements in the information technologies, computers have become an inseparable part of education and thus computer education has become a prerequisite for the teacher training. Computer self-efficacy is individuals' beliefs on their capability to use the computer (Compeau and Higgins, 1995). The levels of computer self-efficacy is reported to be related to the decisions of individuals' on engaging in computer related tasks, spending effort, persistence in learning about computers, apart from their judgments on the importance of the computer using (Aşkar and Umay, 2001; Sam, Othman, Nordin, 2005). Computer self-efficacy can be also defined as the self-perception on the one's capability related to specific computer skills and knowledge (Murphy et al. cited in Moos and Azevedo, 2009). In terms the instructional practice of teachers', computer self-efficacy can be counted as an important factor in determining the use of information technologies as educational tools. This utilization can differentiate according to the self-beliefs and individual characteristics of teachers such as gender, age, earlier experience and subject area (Paraskeva, Bouta, and Papagianni, 2008).

In higher education the use of e-learning based applications are becoming prevalent (Alexander, 2001; Selim, 2007). The use of Information and Communication Technologies (ICT) in teaching and learning seems to provide solutions at least some part of the problems that are faced in higher education (Alexander, 2001). The reasons to use technology in higher education are grouped in four by Bates

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(1997). These reasons are, improving the quality of learning, improving access to education and training, reducing the cost of education, and improving the cost-effectiveness of education. In the present study, the effectiveness of an e-learning based computer course on the computer self-efficacy levels of pre-service teachers is investigated in a one-group pre-test post-test experimental design.

METHOD

Sample

The sample is consisted of pre-service teachers that are 20 female (41.6 %) , 28 male (58.4 %) in total 48. The participants of the study attend to Elementary Mathematics Education Department of Istanbul University, Hasan Ali Yücel Education Faculty in 2009-2010 academic year fall semester.

Measures

Computer Self-Efficacy Scale: The computer self-efficacy is developed by Aşkar and Umay (2001). The scale is composed of 18 items and a Likert type scale (1=always to 5=never for the reverse items). The higher the score gained from the scale indicates the higher the academic self-efficacy score. The Cronbach alpha score of the scale is reported to be .71.

Besides *a demographic information form* and *a 3 items questionnaire* in order to gain information on the participants' computer experience levels are also applied.

Procedure

In the pre-test of the study the participants are applied the measures in the beginning of the 2009-2010 academic year fall semester. Following the pre-test they attended to the e-learning based computer course. The course is designed as a learning management system. The students were able to acess all the documents related to course from this system. Besides they completed the homework or other course related duties by use of the learning management system. At the end of the semester the participants are applied the post-test. The descriptive and inferential statistics are applied after the data collection.

RESULTS

In this part, the descriptive analyses related to the data gathered by means of the measures are reported. The mean and standard deviation of computer self-efficacy scores of the sample in pre-test and post-test are M= 47. 83, SD= 5.58, and M= 49. 77, SD= 7.52, respectively. The one-sample t-test conducted revealed that there is a significant increase in the computer self-efficacy scores of the sample in the post-test when compared to the pre-test scores ($p<.001$).

CONCLUSION

As it is reported by Zhang, Zhao, Zhou and Nunamaker (2004) that "Internet and multimedia technologies are reshaping the way knowledge is delivered, and that e-learning is becoming a real alternative to traditional classroom learning" (p. 76). In other words, as the technology advances the use of these advancements reformulate the way teachers and students consume knowledge apart from the knowledge delivered traditionally in the regular classroom. When compared to the traditional classroom learning, the use of e-learning based applications on teaching and learning have many advantages, which can be listed as being learner-centered and self-paced, flexible in time and location, cost-effective, unlimitedly accessible, archival in terms of reuse and share.

In the present study; the effect of an e-learning based computer course on the computer self-efficacy levels of pre-service teachers on the computer education course are investigated. According to the results of the study, it is found that the computer self-efficacy scores increased significantly in the post-test. That is this significant increase can be reported to be effectiveness of e-learning based computer course. The relevant literature demonstrate that although for unprepared students in terms of computer familiarity may cause negative impacts on the instructor or other students (Fink, 2002 cited in Levy, 2003), e-learning based courses lead better performances on the students parts as did the traditional courses (Beyth-Marom, Chajut, Roccas, & Sagiv, 2003).

In the literature, studies aiming the understand the relationship between computer self-efficacy and e-learning based learning, primarily stress on the effect of the self-efficacy on students readiness to learn in an e-learning based environment (Welsh, Wanberg, Brown and Simmering, 2003). In the current study the main focus is on the self-efficacy levels of the pre-service teachers in an e-learning based computer

course. As it is stated before, the computer self-efficacy may change related to encounters and experiences with computers. However, the results of this study should be evaluated in caution because of the deficiency of a control group, which could be compared to the experimental group in the research design. That is, a following study should be conducted with a control group in order to test the effectiveness of the e-learning based computer course when compared to a traditional in-class computer course.

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EFFECTS OF LINEAR TEXTS IN PAGE SCROLLING AND PAGE-BY-PAGE READING FORMS ON READING COMPREHENSION INTRODUCTION

Ayfer Şahin*

Abstract

This research aims to analyse the Effect of Scrolling and page by page moving Static Texts on Comprehension of Screen Reading of 4th grade students of secondary education. The working group of the research which has been done with Quasi experimental method is composed of 46 students of 4th grade students of a elementary school in Kırşehir Central Province. The classrooms in which the research has been done has been selected by random sampling method. The students were appointed to experiment group and control group according to the result of drawing. The achievement test for reading comprehension has been applied as a preliminary test in order to understand the readiness level of the two groups. Then, 6 texts,compliant with the level of the students, (two narrative and two informative texts and a poem) were read by the students. The students in the experiment group read the text with scrolling method and the students in the control group read the text with page by page moving method. As a post test, reading comprehension test composed of 30 questions, has been applied to students of both groups.It is believed that the recomendations which will be genrated in the light of the data of the research, will play a guiding role on the regulation of screen reading text for elementary-level students.

Key Words: Linear texts**,** page scrolling, page by page moving, screen reading, comprehension.

Introduction

With the technology making its mark on all areas of the age we are living in, it is now a necessity to utilize technology also in the field of education. The age we live in affects the reading habits of the most of the world negatively. When reading, or reading from paper as we know, is in question, particularly children and the youth tend to computers which are cheaper and easier sources of information. Screen reading has become a necessity due to the rapidly developing information technologies of today. Because texts are more and more transferred into computerized pages and published by means of computers. In order to reach new information, readers have to read from screen. By this way, a new way of reading called as "screen reading" and a new kind of reader referred to as "screen reader" have appeared. This way of reading that becomes widespread in all areas has distinctions from the conventional way of reading from paper (Günes, 2009). It is now possible to learn through screen reading and to design and develop the customizable reading media that distinguish the individuals and differentiates according to their differences (Brusilovsky, 2003).

The fact that the amount of information to be learned increases incrementally and the learning needs being continuously updated due to the information loosing their currency in time necessitate a change in the point of view regarding learning and learning environments (Khan, 1997; Alotaiby, 2005). This requires the implementation of a number of changes pertaining to modernization of learning programs. It is known that the effectively used instructional technologies increase the effectiveness of the learning - teaching process. For this reason, the educational development objectives of many countries in the recent years also cover the integration of computer technologies with instructional programs (Korkut & Akkoyunlu, 2008).

In this context, also the Ministry of National Education (MNE) of Turkey establishes Information Technology Courses in all schools and stipulates students to learn to use computers and more importantly raises generations that reach information through internet access. The skills for "using information technologies" have been included among the basic skills to be taught to students in the primary school programs modified in 2005 (MNE, 2005).

Besides modifying the programs, MNE also restructures learning environments in order to raise individuals capable of utilizing the technology. With the Increasing Opportunities and Improvement of Technology Project of 2010, which has been planned in line with the objective related to the utilization of

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information technologies in our education system stated in the (2006-2010) Information Community Strategy prepared by State Planning Organization as "Information and communication technologies will be among the fundamental tools of the educational process and the active utilization of these technologies by the students and teachers will be ensured.", the Ministry has initiated the works for equipping 620.000 classrooms of all our pre-school, primary and secondary schools with laptop computers, projection tools and internet infrastructure in order to ensure the effective utilization of IT tools during the courses, for the purpose of providing equal opportunities and improving the technologies of our schools. (URL-1, 2011). For this reason, it is believed that electronic texts will be more frequently utilized in educational environments in the forthcoming years.

Since the functionality of the reading process is directly related with the design of these environments (Altun, 2000), it is needed to know how the reading text to be presented to the students on the educational environments are to be designed and with which kind of text can the most effective results be obtained. In this paper planned with this purpose, the effect of linear texts prepared in page scrolling and page-by-page reading forms used in Turkish courses, on the reading comprehension skills of the students attending to 4th grade of primary schools, has been examined. The pages where information are provided in a computerized environment can be designed in two separate forms as the long pages where the information is viewed by moving the page up and down by using a ***page scroll*** bar or the page***-by-page*** designs where information is divided into small pages that can be viewed one by one by using the next page or previous page buttons.

Linear text or linear hypertext are designs of hypertext that allow transitions from the current screen only to the next or previous screen are possible and where a linear movement is allowed between the screens through the links given (Cakmak & Altun, 2008). When working with linear texts, the reader or the learner has to follow the path provided by the designer in order to access the information necessary for learning. Information beyond the linear path cannot be accessed from the current point. Both in printed materials and conventional computer aided educational materials progress is made in a linear way. Linear order is considered to be more convenient for presenting details and cause and effect relations (Ayersman, 1996: 505 quoting from Gordon, Lewis, 1992). Emphasizing that linear texts are one of the fundamental structures of hypertexts, Karadeniz, Karatas and Kilic (2004) states that "(a structure where) the reader or student reads the information in order and passes to another one after finishing one is a linear structure".

During the composition of this paper, many researches on the texts to be read by students and the environments in which these are to be submitted in has been found in the literature (Eyuboglu, 2007; Dunser & Jirasko 2005; Karadeniz 2004; Kilic & Karadeniz, 2004; Calcarterra, Antonietti, Underwood, 2004; Schwartz, Andersen, Howard, Hong & McGee 2004; Lee & Tedder, 2003, Graff, 2003; Kim 2001; Ford & Chen, 2000; Leader & Klein 1994). Yet, these studies were generally conducted with high-school and university students. On the other hand, very few studies conducted with primary school students have been found (Cakmak & Altun, 2008; Riding & Grimley, 1999; Reinking, 1988). Similarly, according to Eyuboglu and Orhan (2009), although there are many studies on the design properties of hypertexts (such as the page arrangement of the menus, different types of menus and links, and browsing tools) a relatively lightly focused matter in these studies are the page lengths of hypermedia or hypertexts. With the purpose of filling this gap in the literature, this study has been conducted in order to set forth the effects of scrolled and page-by-page displayed texts on the reading comprehension of the students attending to the 4th grade of primary school. Within the frame of this general objective, the answers of the below given questions have been sought:

1. Is there a significant difference between the reading comprehension preliminary test success rates of the students of the experimental and control groups?
2. Is there a significant difference between the reading comprehension preliminary test success rates among the students of the experimental group?
3. Is there a significant difference between the reading comprehension preliminary test success rates among the students of the control group?
4. Is there a significant difference between the reading comprehension final test success rates of the students of the experimental and control groups?

Method

The study is an empirical study based on preliminary - final test model with control group.

Study Group

The research has been conducted with a total of 44 students attending to randomly selected two fourth grade branches of a primary school located in Kirsehir city center, during the 2010-2011 educational spring season. The students which were available in school on the days when preliminary and final tests were conducted have been included in the study. By casting lots, one of the branches has been determined as the control group where the texts are presented in a page scrolling format, while the other has been determined as the experimental group where reading texts have been submitted in a page-by-page format. Experimental group consists of 19 students. 31,6 % of these are females while 68,4 % are male students. The control group consists of a total of 25 students, of which 44 % are females and 56 % are males.

Preparation of the Texts

The texts have been compiled from the school book of Koza Publications, which the Board of Education and Discipline had distributed to primary school 4th grade students as textbook in the previous years and which no longer was being implemented at the date of the realization of the tests, due to the expiry of its recommended term. This book has been selected so that the students could not have read it before. The 2005 Turkish Curriculum for Primary Schools stipulates that three kinds of texts are to be included in the textbooks. These are narrative texts, informative texts and poems. It has been paid attention for the texts to be given to the students in this study to include all of these three kinds of texts and two texts for each type have been selected. The titles of the selected texts are given below:

Narrative texts;"Seeing Bird Chirps and Bakery Smell" and "The Flute that Lost its Sound".
Informative texts; "How to Cope With Your Phobias" and "The Hand".
*Poems; "*Farmers" and "The Requiem of the Olive Tree".

When the selected texts have been arranged to fit both page scrolling and page-by-page reading techniques by the researcher, also visuals that will aid and ease the comprehension of the context of the texts have been added and computerized.

Implementation Phases

The implementations pertaining to reading the texts from screen have been carried out in the information technology classroom of the school of the participants. Before starting the implementation, the computers in the classroom have been checked and ensured to be in working condition. 13 computers have been determined to be properly working and the text files to be read have been saved on the desktops of these computers. The works have lasted for a total of 6 weeks. Each week, on the hours when the students attend to their Information and Technology course, the students of both control and experimental group have been separately asked to perform screen reading by the researcher for 2 hours. Due to the fact that the number of the students in both groups exceeds the number of available computers the students have been divided into two groups and they have been allowed to the classroom separately to read the same texts. When a group has entered into the information technology class to read the selected texts, the other group has continued their courses in their own classes with their class teachers. Before starting the implementation, it has been checked whether the students know about the basic computer commands. Since the students have attended computer course through their fourth grade, it has been observed that they all have the basic computer using skills.

Each week one of the texts prepared with page-by-page reading form have been read from the screen by the students of the experimental group. Each time, the texts have been read aloud by the researcher one time before the students. After the exemplary reading, the students have been asked to silent read the texts a couple of times. Then, the texts have been read aloud by the students. In the meantime, the other students have been instructed to listen to and follow the text being read. After it has been ensured that the text has been comprehended by the students, they have been asked to take a multiple choice text concerning the read text.

The same process has been implemented with the students of the control group in their own Information Technology courses for the same 6 texts arranged in page scrolling format.

Measuring Tools

Preliminary test: After the students had been divided into experimental and control groups, a reading comprehension test consisting 30 questions has been applied as the *preliminary test*. In order to prepare the reading comprehension test, the 39 attainments concerning reading comprehension for the fourth graders as per the Primary School Turkish Curriculum has been determined (MNE, 2005: 92-94). It has

been ensured that the questions included in the reading comprehension test inquire these attainments. At first 50 questions have been prepared. The words, sentences and paragraph lengths have been paid attention to in order to balance the difficulty levels of the texts included in the test. Two Turkish teachers and two class teachers have been consulted in order to ensure that the questions are understandable and suitable for the skill levels of the students. After being rearranged as per the experts' opinions, 40 questions have been submitted to 120 students attending to the fourth grade of a primary school in the city center of Kirsehir. Item discrimination index and item difficulty index have been determined for each item as per the results of the application. By correcting the questions with low item difficulty and discrimination indexes, the measuring tool has been given its final form with the number of questions reduced to 30.

In consequence of the Kuder Richardson-20 statistical analysis conducted with the purpose of examining the internal consistency between test scores, the KR-20 reliability coefficient of the reading comprehension test the students were to be subjected to has been calculated as .83. The 30 question comprehension test prepared in this way has been applied to the students in experimental and control group at the same date for an hour for each group and in the form of reading from paper.

Final test: The measuring tool implemented as the final test has been formed out of 5 questions at information level for each text read. The scale had been initially prepared with 48 questions (as 8 questions for each text) and then had been evaluated by 4 experts (2 Turkish teachers and 2 class teachers) in order to tests its validity. In accordance with the feedbacks received, some of the items have been removed from the test and some others have been rearranged. 130 students attending to the 4th grade of a primary school in Kirsehir city center has been subjected to the new form of the test that covers 40 questions. In conclusion of the analysis conducted in order to determine reliability, the questions determined to have low reliability have been removed from the test. However, with the purpose of the test covering all six texts equally, the distracters of some questions have been rearranged and kept in the test. The KR-20 reliability coefficient of the test prepared in this way with 30 questions, as 5 questions for each text, has been calculated to be .81. Sencan (2005) emphasizes that, in case the KR-20 formula is implemented for a test consisting low number of items, even a score as low as .50 can be sufficient for deeming the test reliable. According to this, it has been accepted that a .81 reliability coefficient found for a 30 question test indicates a good level of reliability in terms of the norm based test approach.

The students have been given one point for each question they have answered correctly during the tests. Wrong answers have been ignored. Therefore, the highest score the students can get from the preliminary test and final test has been determined to be 30 points.

Data Analysis

Average, percentage, frequency and standard deviation have been utilized in analyzing the data. For comparing the scores the students of the experimental and control groups have obtained T-Test for independent samples and for comparing the final test and preliminary test results of the students T-Test for dependent samples have been utilized. Significance level for comparisons has been determined to be .05.

Findings

The findings related to the reading comprehension scores of the experimental and control group have been summarized in the following tables:

Table 1. *Independent T-Test Results of the Preliminary Test Scores of Experimental and Control Group Students*

Groups	N	$\bar{X}$	S	Sd	t	p
Experimental	19	21,63	4,43	42	3,61	0,01
Control	25	25,76	3,14			

P< 0.05

According to the findings given in the table, there is a significant difference in favor of the control group between the points scored by the experimental and control groups from the preliminary test, conducted in order to determine the students' reading comprehension levels (t (42) = 3,61 and p<.05). While the

reading comprehension preliminary test score average of the control group students is (X= 25,76), the reading comprehension point averages of the control group student has been calculated as (X= 21,63).

Table 2. *Dependent T-Test Results of the Preliminary Test - Final Test Scores of Experimental Group Students*

Measurement	N	$\bar{X}$	S	Sd	t	p
Preliminary Test	19	21,63	4,44	18	1,77	0,93
Final Test	19	20,32	4,30			

P>0.05

No significant difference has been found between the preliminary test points of the experimental group students regarding paper-reading comprehension and the final test points they have obtained in relation with the text they have read by means of page-by-page screen reading (P>0.05). While the preliminary test point average of the students has been calculated as X= 21,63, their final test point average has been determined to be X= 20,32.

Table 3. *Dependent T-Test Results of the Preliminary Test - Final Test Scores of Control Group Students*

Measurement	N	$\bar{X}$	S	Sd	t	p
Preliminary Test	25	25,76	3,14	24	4,23	0,00
Final Test	25	22,84	2,85			

P<0.05

There is a significant difference between the paper reading comprehension preliminary test points and the page scroll reading comprehension final test points of the students of the control group ((t (24) = 4,23 and P>0.05). While their preliminary test point averages of the students had been X= 25,76, their final test point averages has declined to X= 22,88.

Table 4. *Independent T-Test Results of the Final Test Scores of Experimental and Control Group Students*

Groups	N	$\bar{X}$	S	Sd	t	p
Experimental	19	20,32	4,30	42	2,34	0,24
Control	25	22,84	2,85			

P>0.05

Independent T-Test results for the final test point averages of the students of experimental and control groups are given in Table 4. According to the findings presented in the table, there is no significant difference between the final test point averages obtained by the students of the two different groups (t (42) = 2,34 and p>.05). This indicates that the primary school 4th grade students comprehend the texts they read by page scrolling and page-by-page forms with similar levels. While the control group students have answered 22,84 of the 30 questions related with the text they have read by page scrolling correctly, the experimental group students have answered 20,32 of the questions related with the same texts they have read page-by-page.

Conclusions and Discussion

Although a significant difference has been found in the study for the students of the control group between the paper reading comprehension preliminary test results and the page scrolling reading comprehension final test results, no such significant difference could be found for the students of the experimental group between the points they have scored from the tests examining their comprehensions from paper reading and the page-by-page screen reading. However, it can be stated that this results from the fact that a significant difference in favor of the control group has been found between the preliminary test results of the experimental group students and the preliminary test points of the control group students. Since the students have been randomly divided into experimental and control groups, it can be

interpreted that the equalities have not been established at the first place. Also, there are studies in the literature pointing out that reading from paper or from a screen does not have any advantages over each other. In this context, in the study conducted on 33 students from fifth and sixth grades Reiking (1988) has reached the conclusion that reading linearly presented texts from a computer screen does not bring any advantage over reading them from printed materials, in terms of aiding recollection.

In this study, the point whether the linear texts, which had been prepared for Turkish course, read through page scrolling and page-by-page screen reading have any effect on the reading comprehension skills of the 4th grade primary school students, and it has been determined that there is no difference between the final test success rates of the students of the control and experimental groups. This is to indicate that 4th grade primary school students comprehend the texts they read by page scrolling or page-by-page display at similar levels. In the literature, it is possible to find many studies with conclusions either supporting or contradicting with the conclusions of this study. Eyuboglu (2007), Bernard, Baker & Fernandez (2002) and Nielsen, 1997 have found that readers and students mostly prefer texts presented in long pages. In his research examining the effects of page scrolling and page-by-page reading on comprehension, Baker (2003) has once again found that page scrolling has a more positive contribution in the comprehension levels, compared to advancing through the pages with a forward button. On the other hand, Roussey & Thunin (1998) have determined that dividing information into separate pages and presenting it in a form that can be viewed page-by-page increase performance (quoted by Bernard, Baker & Fernandez, 2002). The findings of the mentioned study do not coincide with the finding of this study.

In another study, it has been concluded that page-by-page reading is mostly preferred by inexperienced users, yet it does not create a significant difference in completing a given task or conducting a search within the text (Schwartz, Andersen, Howard, Hong, and McGee (2004)). In some other studies it has been concluded that neither of the techniques have any effect on user performance (Bernard, Baker, and Fernandez, 2002 quoting from Mills & Weldon, 1986). These findings support the findings of the present study.

Suggestions

By conducting researches similar to the present study, in which the comprehension levels of the 4th grade primary school students from page scrolling and page-by-page reading have been examined, with different regions, different schools and for different grades and age groups, the matter how the page lengths and designs of the screen reading or learning materials are to be prepared for primary school students can be determined.

In this study, the students have been provided with linear hypertext samples of a single type and structure, where the students have to follow the path the designer provided and cannot jump to the information beyond the designed linear path. Accordingly, the determinations are limited for the texts of this type and structure. Therefore, the study can be repeated for hypertexts of different structures as hierarchical, nonlinear and mixed hypertexts.

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THE EFFECT OF USING COMPUTER ANIMATIONS AND ACTIVITIES ABOUT TEACHING PATTERNS IN PRIMARY MATHEMATICS

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ABSTRACT

In this study it is investigated that teaching of different pattern types by using computer animations and activities. The sample of this study was 28 eighth grade students in second semester of 2010-2011 educational years. They are at public school in Ankara. The one group pre-test post-test design was used for research methodology. Data were collected by pre-test and post-tests which were developed by researchers and it was revised in terms of reliability and administered to the students. The subject showed by using computer to the students after pre-test. At the end of the teaching, that achievement test is applied on the group as the post-test. For data analysis, quantitative methods were used. According to the findings; academic performance of the students increased by using computer animations and activities about patterns. Also, it is found that there was a significant difference between academic performance of students about different pattern types.

Keywords: mathematics education, patterns, computer animations, teaching strategy

INTRODUCTION

Mathematics, which is known to improve thinking, is one of the most important devices.As it is known, the basic property which distinguishes humans from other living beings is the ability to think, making inferences and rearranging condition suitable to him (Umay, 2003).

Mathematics is a science which has application in science, technology and in all other sciences, and mostly it is called a science of order and pattern. It doesn't mean numbers and operations carried out with them (Yaman, 2010). A sub-branch of maths which we confront in nature, art, environment and in many other areas is geometry. Geometrical shapes and objects which have an important place in human life are encountered frequently in daily life. When we look around there are quite a lot of geometrical shapes, patterns and structures in the good we use (Gürbüz, 2008).

The pattern concept encountered prevalently in daily life has started to be given at primary education level. Pattern concept which takes place in primary education maths curriculum, especially at the levels of 6^{th}, a 7th and 8th grade is given with different presentation forms.

Especially given the level of primary education algebra means that abstract and fight for students (Willoughby, 1997). The education of algebra that began in the 7th grade with the Mathematical Curriculum, changed in 2004, begins to be given from the first years of primary school with the new programme. Among the subgroups of algebra, patterns and decorations subject, which is appropriate for the level of students and more concrete, take place in the first step of the primary school in the Mathematics Programme. With the help of this subject, students can make generalizations by seeing concrete models. How the pattern will be presented is as important as the pattern concept itself, taking place in the Mathematics Programme and also significant for Mathematical Thinking. When the studies are examined, it is seen that the achievements of the students with different presentations about patterns has been examined but the 8th grade students' hasn't been yet. For this reason in this study, the achievements of the 8th grade students with different presentations about patterns are compared. In the comparison it is determined that in which presentation students are more successful.

In Mathematics teaching, students have difficulty in especially abstract subjects such as algebra. As well as the subjects, teaching methods and techniques applied on the students for these subjects cause that they are seen as difficult and impossible to understand. In order to make the students like Mathematics and increase their academic achievement, it is necessary to notice them the enjoyable and usable sides of Mathematics in daily life. This helps students break their prejudice. Among the subgroups of algebra, patterns and decorations subject, taking place in Mathematics Programme especially from the first years of the primary school, and the way of their presentations can also help the students break this prejudice. The students can see different ways of the subjects with different presentations of the same question and learn the subject suitably for their own level. With this study it is aimed that in which presentation of patterns students get the relation between the numbers better and make generalizations easily. Nonetheless, it is thought that this study will be a leading for the new Mathematics Programmes.

A BRIEF REVIEW OF LITERATURE

Early grades, algebraic notation can play a supportive role in learning mathematics (Carraher, Schliemann, Brizuela & Earnest, 2006). It is clear that algebraic thinking is a particular form of reflecting mathematically (Radford, 2006). The National Council of Teachers of Mathematics (NCTM, 2000) recommends that the development of algebraic reasoning begin with experiences with patterns and relationships in Grades K-2, incorporate variables and expressions in Grades 3-5, and focus on analysis, representations, and generalisations of functional relationships in Grades 6-8. On the basis of algebraic thinking patterns, patterns of relationships between and patterns of generalization (Yaman, 2009). Number patterns, the relationship between variables and generalisation are considered important components of algebra curricula reform in many countries (Samsan, Linchevski & Olivier, 1999).

Children, from a very early age, love colouring patterns and Islamic patterns may be utilized introduce symmetry at the tender age of 3 or 4. At the university level, the patterns may be used to teach transformation geometry (Abas, 2004). A major learning goal for students in the primary grades is to develop an understanding of properties of, and relationships among, numbers (NCTM, 2011). Children's thinking processes in generalisation reports on children's strategies in abstracting number patterns and formulating general relationships between the variables in the situation (Orton and Orton, 1994). The relationship which is called functional relationship begins with the notion of patterns in early grades, develops gradually in algebraic thinking process, and gains the abstract manner with the function notion (Kabael, Tanışlı, 2010).

From the national survey, reasoning on geometric number patterns is a proper initial activity for learning algebraic thinking in Grade 7 (Lin, Yang, 2006). The study of patterns' generalization in school mathematics has been the focus of research conducted over the last years. Many researchers have made some attempts to investigate stages or levels in the development of patterning ability mainly focused on students' ability to generalize (Cruz, Martinon, 1998). Some definitions are in order here by Bishop (2000),

> A number pattern is a sequence of numbers in which there is a well-defined rule for calculating each number from the previous numbers or from its position in the sequence. In a geometric number pattern, the numbers relate to a sequence of geometrical figures in which each figure is derived from the previous figure by some well-defined procedure. A number or geometric number pattern is linear if each number is obtained by adding a constant increment to the previous number or, equivalently, if each number is a linear function of its position in the sequence.

Past research has indicated that children tend to have a propensity to look for the additive strategy (look down the table) when searching for patterns in tables of values (Warren, 1996). Children try to construct simple multiplication (proportional) structures, but when it does not fit the database, they quickly give up and then invent all kinds of error-prone recursion strategies. In all activities where students identified a function rule, most of them described their rule in words rather than using symbols (Samsan, Linchevski and Olivier, 1999).

Experiences with a variety of patterns help students recognize order and make predictions. Creating patterns gives students opportunities to describe what is being repeated or how the pattern grows and to explain what should come next (NCTM, 2011).

From 2000 to 2005, close to 70,000 students in the US Bay area participated in open-ended assessment that involved generalizing linear patterns. Five years of data collection and analysis of 8th grade students' work have shown that while 72% of those tested could successfully deal with particular

cases of linear patterns in visual and tabular form, less than 18% of them could use algebra to express correct relationships or to generalize to an explicit, closed formula (Rivera & Becker, 2006).

As students work with multiple representations of number and with counting, their knowledge of number concepts grows more sophisticated. As students have repeated experiences with patterns, they will be able to make and investigate conjectures about counting sequences (NCTM, 2011).

METHODOLOGY

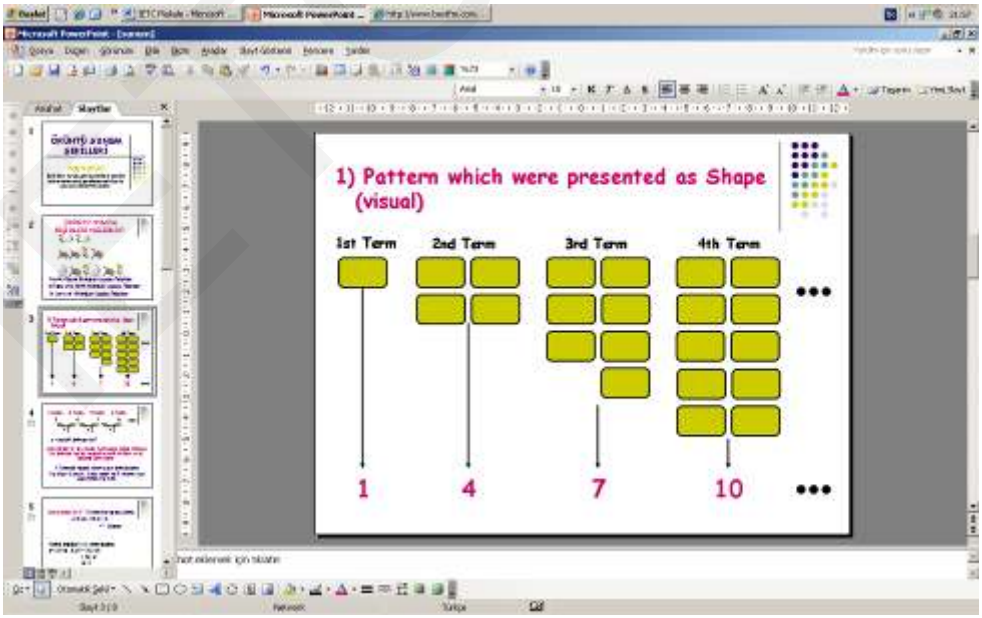
In this research;

. ● Is reminding has an effect, according to presentation styles of 8th grade students, in their performances with mathematical patterns by using computers?

● Is there a meaningful relationship between performances regarding mathematical patterns according to presentation styles of patterns at the reminding in 8th grade students by using computer? questions will be answered.

The application was carried out at a primary school in 8th grade class belonging to National Education Ministry in Ankara. We worked with 28 eighth-grade students (11 boys, 17 girls, mean age of 13) in an urban school in Ankara. Prior to application a pretest comprising 6 questions prepared by scientists was applied to the students (appendix-1). The questions were prepared by using three different presentation styles from linear increasing patterns (shape, number sequence, and table). While the validity of the questions were provided by taking expert opinions, the reliability coefficient was found as α =.8905. Reliability coefficient of achievement tests being more than 0.70 is a sign sufficiency of reliability level (DeVelles, 1991). The result of the analysis show the level of validity and reliability was high for pattern subject of maths lesson. The application was carried out for four hours with 28 students in the 8th grade in a primary school chosen for the application. In the first lesson pre-test was applied. Students knew pattern presentation styles which could be shown in three different ways comprising shape, number sequence and table. During the application students were educated for two hours by using computer in a way to remind presentation shapes (figure–1). The presentations which were used during the application were prepared by the scientists in accordance with the curriculum by scanning necessary literature. Different examples belonging to three different presentation styles were solved with the students and the application was completed and following this a post test was applied.

Figure – 1: The example belonging to the presentation used in the application



RESULTS

In this section, in order to answer the questions, took place in the search, the findings, reached by reason of data's statistically analysis and the comments, based on these findings, and are mentioned.

Findings and Comments about the Pre-Test Marks of Experiment and Control Groups

In order to find an answer for the first question in the search, it is analyzed if there is a significant difference between pre-test and post-test marks of the groups on whom they made application. The students' pre-test and post-test average marks they take from the achievement test about patterns in Math lesson, standard deviation values, and results of paired sample t-test are such as in table-1.

Table-1: The Paired Sample T-Test Results about Pre-Test and Post-Test Average Marks

Measurement	N	$\bar{x}$	S	df	t	p
Pre-test	28	2.21	2.347	27	-4.500	.000
Post-test	*28*	*4.79*	*1.371*			

After the reminders with using computer, students' academic achievement has a significant increase in pattern lesson [t_{27}=-4.500, p<.01]. As the average of the true answers, that the students give before the applications, is $\bar{x}$ = 2.347, this average increases to $\bar{x}$ = 4.79 after two-hour application with computer. This finding shows that the reminder, made by computer, has a significant effect on increasing the academic achievement of the 8th grade students in linear increased pattern.

Findings and Comments Related With Academic Achievements According To Pattern Presentations Based On Final-Test Results

In order to find an answer for the second question in the search, by looking the post-test marks of the group, it is analyzed if there is a significant difference between their academic achievements according to the pattern presentations. The questions in the achievement test are grouped as set of number presentation style, figure presentation style and form presentation style, and the difference between these groups are compared. The average post-test marks of 28 students, in the application, according to different presentation styles of patterns' achievement test in Math lesson, their standard deviation values and *simple factored ANOVA* results of the paired sample are such as in table-2.

Table-2: Post -Test Marks' ANOVA Results According To Pattern Presentation Styles

Variance Source	Total Squares	df	Average Squares	F	p	Significant Difference
Intersubjects	16.905	27	0.626			
Measurement	3.167	2	1.583	10.469	.000	1-2,1-3
Mistake	8.167	54	0.151			
Total	28.239	83				

1-Form presentation style, 2-Figure presentation style, 3-Number sequence presentation style

It is found a significant difference between set of form, number and figure from the students' pattern presentation styles [$F_{2\text{-}54}$=10.469, p<.01]. Figure presentation style mark ($\bar{x}$ = 1.7143) and set of number presentation style mark ($\bar{x}$ = 1.7500) are higher than form presentation style mark ($\bar{x}$ = 1.3214). On the other hand the difference between figure presentation style and number sequence presentation style is not seen as significant.

The finding shows that the students are more successful with the figure presentation and number sequence presentation style than that of form presentation style.

DISCUSSION

In this section, it is mentioned about the results, reached by the findings and comments of the search said before, the arguments about these results and suggestions developed by the results.

In this study, the achievements of the 8th grade students with different presentations about patterns are compared after the reminders made by using the computer aided teaching. In the comparison it is determined that in which style of presentation students are more successful. When the data, obtained by this aim, is examined, those results are reached: According to the pre-test results, made before the application, a significant difference isn't seen between the academic achievements of the students with different presentations about patterns.

At the end of this search, it is appeared that the reminders, made by using the computer aided teaching, are effective in increasing the achievements of the students about the patterns and decorations in Mathematics. This result shows that computer aided teaching has positive effects on the achievements of the students and also supports different studies determining that computer aided teaching increases the students' achievement in different teaching levels and subjects. In this search, Akçay supports the studies those of Tüysüz and Feyzioğlu's Science lesson in the 8th grade (2003), of Ebenezer's Chemistry lesson (2001), of Yenice's Primary School Science lesson (2003), and of Sulak's Primary School Maths lesson in the 6th grade. The search above, displays that computer aided learning method has a positive effect on the students' achievements and the findings of the search are parallel with them.

In conclusion, people encounter with computer almost everywhere in Turkey. It is unavoidable for computer to be used while it is commonly preferred by everyone. Enabling active participation and addressing more than one feeling at the same time, computer makes the learning states more dynamic and colourful.

Because of all these reasons, it is thought that computer aided teaching can be used effectively with many lessons including even Maths.

This research is one of the few search made about computer aided teaching in Primary School Mathematics in Turkey. According to the search results, the suggestions for the Mathematics teachers, classroom teachers, and the corporations growing up teachers, program developers and searchers studying on this section are:

1. In primary school level, computer aided learning method can be used more in Maths lessons according to learning areas.

2. In-service training programmes about introducing and applying computer aided learning method for Maths teachers.

3. In universities' Mathematics teaching department, much more lessons about computer aided learning can be studied.

4. Computer aided learning method, used in the search, can be tried on different class levels and different subjects in Maths lesson and then the results can be evaluated.

5. The problems that the Maths teachers, using computer aided learning method, encountered at the time of the applications, can be searched.

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THE EFFECT OF UTILIZING BLENDED LEARNING STRATEGY ON THE ACHIEVMENT OF JORDANIAN FEMALE FOURTH GRADE STUDENTS IN ARABIC PATTERNS AND LANGUAGE STRUCTURES

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ABSTRACT

This study aimed at identifying the effect of utilizing blended learning strategy on the achievement of Jordanian female Forth Grade Students in Patterns and language structure in Arabic Language. The subjects of the study consisted of (51) female students from a public school in the Directorate of Education of the Second District of Amman. The results of the study showed that there were statistically significant differences ($\alpha \geq 0.05$) attributed to the method of teaching in favor of the Blended Learning Strategy. In the light of this result, some recommendations were suggested.

Key words: *Blended Learning, Modes and Language Structure in Arabic Language, Achievement Level.*

INTRODUCTION

The remarkable infusion of Information and Communication Technology (ICT) into our lives has greatly affected the world today as well as the school as an integral part. The past twentieth century left a huge legacy of technology, communication in particular, changing the whole globe into a small village whose parts are closely connected via satellites and internet. In the light of the rapid developments of (ICT), it is imperative to raise the question: Where is the educational curriculum located nowadays? It goes without saying that the concept of the traditional curriculum, or the text book, has dramatically changed since it has no longer been a sufficient source of information for learners, where the mediated technologies and internet provide an easy and flexible access to information that every learner should take advantage of to obtain knowledge and develop the teaching – learning process.

However, could these technological advances have positive reflections on the re-innovation and development of educational curricula in a way that guarantees greater satisfaction that meets the aspirations of learners, instructors, and the whole society of all its institutions as well? Could an alignment be created between the curriculum and technology to produce what might be called the technological curriculum? With standing the fact that technological developments are always faster than the educational.

In effect of the Jordanian educational initiative with regard to computerizing the Arabic language curricula, the Ministry of Education signed an agreement with the French Telecommunications Company (Orange) on 4/11/2004. For this purpose, the roles have been determined to all participating parties in the project as follow: - The Ministry of Education: to supply labor force including supervisors and teachers, French Telecom: to finance the project, - Jordan Telecom Group: to manage the project in Jordan, E- Dimension: to implement the project and Enic Telecom Lille: (institute) to provide the technical expertise, guidance and general supervision.

The computerized Arabic language material is characterized by providing (480) hours of the curricula learning content accredited by the Ministry of education for all school grades (from the first grade to the twelfth grade), re – presenting the curricula in a richer and simpler way. Furthermore, it is based on the Blended Learning (BL) rather than the self – directed learning. (Jaradat 2006)

In general, Blended Learning (BL) is not considered a new concept. As a pedagogical approach, BL stems from most tendencies that called for combining learning strategies with a wide variety of modes and means; therefore this process has acquired different terminologies: Blended Learning, Hybrid Learning, and Mixed Learning (Orey, 2002). Being broadly varied, BL approach is based on several elements, such as: experience, context, students, learning objectives, and sources. Thus, there is no one specific strategy adopted for blending. To render a successful and effective Blended Learning relies on the ability to combine the proper and complementary different elements supporting each other in an adequate and practical manner. The definition of Blended Learning (BL) has been of interest to several studies. For instance, in Driscoll's study (2002), BL was defined as having four different meanings:

a- Combining various modes of internet – based technology to achieve an educational objective: Direct hypothetical classes, self – pacing learning, cooperative learning, video instructing, sound instructing, and texts. This definition was later supported by Singh, 2003.

b- Combining various pedagogical methodologies based on several theories: (the Constructive, Behavioral, Cognitive) to render optimal learning with or without the use of technology.

c- Combining any form of technology, like: Video tapes, CDs, Web – based training, Films to be utilized by the teacher in the face – to – face instruction.

d- Blending technology with real tasks in the process of teaching to produce effective creations that might enhance harmony between learning and actual work. This meaning was pointed out in the study of Bersin (2004) as the definition of BL.

Designing the Lessons of Blended Learning

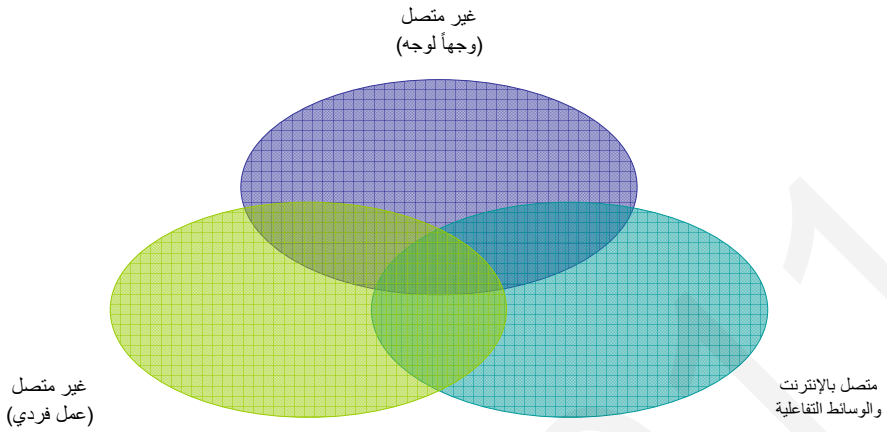
Designing lessons based on BL go through three basic procedures (Dziuban, Hartman, and Moskal, 2004): **First Stage:** Content Analysis: it could include :(General targets and learning objectives which constitute the compass that assists instructors to direct the whole parts of the lesson. Time Span: a time schedule must be determined to ensure a balance between internet activities on one hand and the activities of face - to -face learning on the other hand so as not to overuse one of them at the expense of the other. Those activities should be limited within specific and reasonable but sufficient time to fulfill tasks and activities. It is important to cover the class time adequately with activities avoiding time waste. Therefore, the designer of the program has to create extra activities for the teacher with latitude to decide on their timing. Prerequisites: they are required from both teachers and students. But, the specific academic skills related to the lesson in concern are to be highlighted over other technical skills. Determining the diversity of skills related to the content intended, such as: cognitive, procedural, intellectual, personal, psychomotor.

Second Stage: the methodology of implementing each component of the content. This can be applied in three ways: Offline (face – to - face and work – based) such as: lectures, shows, direct teaching, workshops, role – play, simulation, conferences, training, supervision, feedback, task learning, projects, field visits. Offline (individual work), for example: books, magazines, newspapers, exercise books, portfolio, revision, cassettes, video tapes, TV, radio, DVD, CD). Online and Interactive Media, for example: simplified learning resources, interactive contents, competencies support, simulation , e- instruction, e- training, e- supervision, feedback, e - mail, announcements boards, conversations, sound conferencing, video conferencing, hypothetical classes, research – based knowledge, consulting expertise, research engines, internet websites, news groups).

Third Stage: Analysis of Students Needs**, Fourth Stage:** Regulating requirements and limitations to organize work in general.

Sands (2002) pointed out a group of principles and strategies to be taken into consideration when designing for Blended Learning, they are:

1. Drawing a Venn diagram as illustrated hereunder.



2. Setting strategies workable for each group assigned to apply the content.

3. Reviewing the diagram after every stage of the four mentioned above with a view to reconstructing the diagram.

4. Starting simple with focusing on the final objectives of learning.

5. Focusing on the interactive aspect more than implementation: access to information via the internet might be more effective but it does not at the same time guarantee the actuality of students learning. Thus, the teacher is required to set a number of activities for students to perform basic academic tasks such as: summarization, analysis, and conversation.

6. Managing time in accordance with a clear strategy to be set by the teacher who should be able at the same time to teach new skills.

The Study Problem

The Arabic language is considered a basic and essential material for all students; therefore much of attention has been directed to this subject by teachers. The experiment of the Jordanian Ministry of Education is still considered new in relation to the tendency towards the adoption of BL strategy; thus such studies are of significant necessity. My study seeks to identify the effect of utilizing Blended Learning Strategy on the achievement of Jordanian Female Fourth Grade students in Arabic language patterns and structures. More precisely, this study attempts to find the answer for the following question: Is there a statistically significant difference (0.05>_a) between the two means of marks in the exam on the Arabic language patterns and structures for the fourth grade female students attributed to the groups (experimental and controlled)?

The Study Terms

Academic achievement: the total learning outcome of knowledge and rules related to the patterns and structures of the Arabic language as stated in the fourth grade text book for the year 2005/2006. This outcome is assessed according to the mark of students in the achievement test prepared for this purpose given directly after completing the material in concern.

Blended Learning: it is the learning strategy in which participate the teacher and the students with the utilization of the computer, the text book, the board plus other aids - all of which are to be used according to specific percentages determined by the teacher.

Class traditional teaching: through this traditional class teaching methodology, the teacher writes on the board the title of the lesson with examples adequate for students to discuss in order to elicit the rule and to be able to do the exercises provided in their text books.

The Study Limitations

- The study was restricted to include a sample of the fourth grade female students in Um Habiba Primary School in the Directorate of Education of the Second District of Amman.

- The study focus was limited to examine the language patterns and structures of the Arabic language as provided in the Arabic language text book of the second semester for the year (2009/2010).

- The study only used two measuring tools:

a. The computerized program authorized and applied by the Ministry of Education.

b. The achievement Test.

Therefore, the findings of this study can be generalized on other samples with similar conditions and limitations.

Participants

The participants were girl students from Um Habiba Primary School was randomly selected among the four exploratory schools that apply the e – learning of the Arabic Language – up to the date of preparing this study (Queen Rania Al – Abdullah School for Girls, Dirar Ibn Al- Azwar Secondary School, Um Habiba Primary School for Girls) . Two classes of the fourth grade from three in the school were randomly selected. The study sample from the two classes contained 51 female students. The sample was divided into two groups: the first which included 25 students was assigned as the experimental group to taught according to BL strategy, the second which consisted of 26 students was assigned as the controlled group to receive the traditional class teaching methodology only.

The Study Instruments

First: Learning Material: it was divided into: a. The computerized program; b. The material prepared specifically for the class traditional teaching; and C. The Achievement Test.

The Study Procedures

The study researchers followed the procedures as follows:

1. Reviewing the previous literature pertaining to Blended Learning and its relation with the academic achievement.

2. Designing the study instruments as stated above.

3. Obtaining an official permission from the Ministry of Education, The Directorate of Education of the Second District of Amman, and Um Habiba Primary School.

4. Determining the study sample divided into two groups: controlled and experimental.

5. Getting the results of the final exam in Arabic language (out of 100) for the first semester 2009/2010 from the school principle.

6. Training the teacher of the experimental group on the mechanism of applying Blended learning by enrolling her in a three – day course on BL in which all electronic material of the fourth grade in concern was displayed, allowing the teacher to review most of the lessons and examine their organization and structure. Then the teacher gave a lecture within the micro – teaching program after which she received the required feedback.

7. Conducting an Exploratory experiment.

8. Launching the actual practice of BL at the beginning of the second semester for the year 2009/2010. The teacher of the experimental group started to deliver the lessons of language patterns and related structures from both the book and the computerized material – which is often referred to by an icon of a CD displayed beside the exercises in the book.

To apply the strategy of Blended Learning, the teacher started the lesson on the board to be followed with the computerized material then the board again and the book. For this purpose, the teacher was provided with a laptop and data show by the Ministry of Education for the class to be equipped with necessary aids.

9. Ensuring that the students of the controlled group received the same material, but by delivering the traditional teaching methodology by another teacher who is equivalent in qualifications and experiences with the other group teacher.

10. Applying the achievement test (Post test) directly after completing the experiment.

11. Correcting the test according to the criteria defined by the referees.

12. Entering data and performing statistical analyses required for the purpose of this study.

The Study Findings and Discussion

In order to scrutinize the study hypothesis which has proposed the absence of statistically significant differences (0.05>_a) between the two means of the students achievement in the test on Arabic language patterns and structures for the fourth grade attributed to the two groups (controlled and experimental), Independent – Sample T – Test was used. The results are illustrated in Table (1)

Table (1) The Results of Independent – Sample T – Test to examine statistically significant differences between the two means of the two groups in the achievement test

Groups	No. of Individuals	Mean	Standard Deviation	T value	Degrees of Freedom	Level of Significance
Experimental	25	36.800	4.138	2.694	49	0.010
Controlled	26	33.115	5.505			

The findings of the statistical analysis illustrated in table (1) prove the existence of statistically significant differences between the two means of the two groups: controlled and experimental in the achievement test at the level of significance (0.05>_a) in favor of the experimental group.

The distinction of the experimental group that received Blended learning over the second controlled group who were taught according to the traditional teaching methodology can be attributed to a number of reasons, among them are:

first, the increased student – student interaction and students - teacher interaction through raising questions by the teacher about the material displayed on the computer screen; second, the teacher's use of a diversity of teaching methods – electronic and traditional in addition to her guiding and directive role. Furthermore, Blended learning provided a more cooperative and interactive social environment when compared to the environment in which students received only the traditional learning.

The study findings came in agreement with the conclusion found out in the following studies:

(Anderson, 2002; Dean, 2001; Job, 2003; N J Institute of Technology, 2005; Singh, 2003; University of Central Florida, 2001; Valerie, 2005)

Recommendations:

A number of recommendations based on the study conclusion are highlighted by the two researchers:

- To conduct studies related to utilizing Blended Learning in developing the various Arabic language skills.

- To re - apply this study on other populations with different places, ages, gender, or the academic grade.

- To encourage teachers to design computerized learning programs based on Blended Learning. Add the need for more attention and interest by the Ministry of Education in relation to this perspective.

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THE EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION IN DEVELOPING STUDENTS' ACHIEVEMENT IN KITCHEN AND FOOD HYGIENE

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ABSTRACT

This study investigates the effectiveness of Computer Assisted Instruction (CAI) on undergraduate students in kitchen and food hygiene. The instrument of this research is the Computer Assisted Instructional Package (CAIP) titled "cook safe"*. The research is a quasi experimental study, the sample of this study consists of control group (39 students) and experimental group (41 students) of the first year undergraduate students in its three different departments at the faculty of Specific Education, Alexandria University, Egypt. The student's pre-test and post test scores for two groups were analyzed using independent sample test, paired sample test and Eta-Squared η 2 .The results of this study showed that there is significant difference in the achievement of students in kitchen and food hygiene in favour of students who exposed to CAIP. Based on the research results, recommendations were made on the need to develop relevant CAI package for teaching kitchen and food hygiene in all departments of the faculty.

*Food safety Assurance System / e cook safe Issue 1
http:/cooksafe.dumgal.gov.uk/food safety refresher/safety_40.htm

Keywords: Information technology; Education technology; home management; kitchen hygiene; home tasks management; family health; Computer Assisted Instruction (CAI).

INTRODUCTION

Education technology has logically focuses on computing and information technology literacy (Clark,2001), it is a fact that there is now a wealth of digital resources and information and communication technology tools to support learning and teaching. (Conole, 2004). Computer Assisted Instruction (CAI) is teaching process in which a computer is utilized to enhance the learning environment by assisting students in gaining mastery over a specific skill (UNESCO, 2002). There are now several CAI packages on different subject because of the use of computer facilities and resources to enhance students' learning. (Yusuf, 2010).Computer assisted instruction (CAI) continues to increase, eventually offering several advantages. Some of the benefits of using CAI include emphasis on active learning, enrichment of collaborative learning, encouragement of greater students' independence and task-based teaching (Spinelli, 2001; Prvan et al., 2002). Computers have been promoted as a tool to facilitate learning, subsequently, an enormous growth and development of computer assist instruction CAI in health and hygiene (Werner,2009).

Domestic labor has been traditionally considered a family members' responsibility (Demo and Acock, 1993; Abdelgalil Mona S. 2005). A home is packed with places where germs can breed and spread easily. Kitchen is one of the most main areas have recently been classified as being at risk from contamination. Kitchen hygiene and food safety are an important part of all family members' health, so it is necessary to emphasis the importance of good food and kitchen hygiene practice and of the need to handle and prepare food in a safe

and clean environment (Food safety refresher,2010). The world is rapidly becoming more technologically complex. As a result, learners need to be taught and communicated differently than they have been in the past. Universities must prepare learners to become active members of this changing society to adapt to these transformations as they occur. Also, they must build rich online programs that facilitate and promote multi-way knowledge transfers by having various interactive communication methods, techniques and activities. To save time, energy and money in programs (Edmonds & Barron,2002).The objective of this study is to provides the understanding knowledge on kitchen and food hygiene for the development of students' awareness on kitchen and food hygiene management system, and encourage students to use new technologies e.g. CAI to support education in different domains.

Purpose of study

The study investigated the effect of CAI on the student's achievement in kitchen and food hygiene.

Research question

Will there be any difference in the achievement of students who exposed to the CAI package in kitchen and food hygiene and those taught the same contents using traditional method of teaching?

Research hypotheses

The following research hypotheses were tested in the study:

1- There is no significant difference in the achievement of experimental and control groups before exposing to the educational content of kitchen and food hygiene package.
2- There is no significant difference in the achievement of students who exposed to the CAI package in kitchen and food hygiene(experimental group) and those who taught the same contents using traditional method of teaching (control group).
3- There is no significance difference in the achievement of students (control group) before and after exposing to the educational content of kitchen and food hygiene package using traditional method of teaching.
4- There is no significance difference in the achievement of students (experimental group) before and after exposing to the educational content of kitchen and food hygiene package using CAI.

RESEARCH METHODOLOGY

Research design

This study was a quasi experimental type of the pre test, post test, control group design.
This study represents two groups of treatment; students exposed to computer assisted instruction package (experimental group), and students exposed to the traditional method of teaching (control group). The two groups included male and female students.

Population and sample

The target of this population of this research was all of the first year undergraduate students of the three departments (art education, music education and home economics departments) at the faculty of Specific Education, Alexandria University, Egypt. They divided into two groups depending on acquisition of a computer where computers are available for students' use and where the students are computer literate and selected as the experimental group, a traditional method of teaching was used with the control group. The sample of the experimental group is made up of 41 students, while the control group was made up of 39 students.

Research instruments

The instruments of this research were the treatment instrument Computer Assisted Instructional Package (CAIP) named '' cook safe '' Food safety Assurance System / e cook safe Issue 1 cited on http:/cooksafe.dumgal.gov.uk/food safety refresher/safety_40.htm,and the test instrument "cook safe –test your knowledge".

The treatment instrument, Computer Assisted Instructional Package on kitchen and food hygiene was a self instructional, interactive package that lasted for 80 min; the study of this Package aims to: Understand the importance of food safety, Know what makes food unsafe, Understand the consequences of unsafe food, Identify actions to ensure safe food hygiene practices.

Computer Assisted Instructional Package on kitchen and food hygiene contained thirteen (13) lessons structured into module. The topics covered in the package are: 1- Introduction to the kitchen and

hygiene.2- Hazards; microbiological, chemical and physical.3- Bacteria; Sources and growth, Food spoilage, Food poisoning, Food born disease.4- Training; types of training. 5- Personal hygiene; Personal cleanliness, Protective clothing, Reporting illness / exclusion. 6- Cleaning; Hazards, Methods, Precautions. 7- Temperature control; important temp, using a thermometer 8- Cross contamination prevention; Types, Personal, Equipment, Utensils and cleaning, Food allergies, dealing with food allergies. 9- Pest control; Methods of pest control, House keeping, Checking and inspection. 10- Waste control; Types of waste.11- Maintenance, Premises structure, Equipment and utensils.
12- Stock control, What is stock control, Stock control measures. 13- Kitchen roles and ways to improve kitchen storage space are added to the package and a few sub-headings deleted from the package to facilitate the study. All related to the home management curriculum of the faculty of specific education Alexandria University. It was developed by the researchers to reinforce concepts that appear difficult in this research. The package is provided by the sites related to the topic for more information e.g. http://www.dolceta.eu ,www.eufic.org ,http://www.doityourself.com

This package was chosen for its easy language, simple design, its clarity, cover a subject that most related to family daily activities. The test instrument "kitchen and food hygiene package" was a (26) item multiple choice objective test, fill in achievement test.

Procedure of data collection

All the experimental and control group were exposed to the kitchen and food hygiene test as pretest. Then the students in experimental group were exposed to CAI package.

The students in the experimental group were introduced to the CAI package under lecturers' supervision, long enough for them to be familiar with the navigation buttons and use the package independently.

The control group students were exposed to the traditional method of teaching (face to face method) on the same content used for experimental group, using a conversation and a whiteboard.

The treatment for the two groups lasted for 6 weeks. After the treatment the two groups were exposed to the achievement test which had been rearranged as post test. The raw data were coded and analyzed statistically in SPSS software program (statistical package for social science) version 10.0

RESULTS

The scores of the students in the two groups were analyzed by comparing means of the scores using Paired Sample Test, independent sample test and Eta-Squared η 2. The analysis was done using the four research hypotheses state for the study. The results of the analyses and discussions are as stated below.

Hypotheses one

There is no significant difference in the achievement of experimental and control group before exposing to the educational content of the kitchen and food hygiene package.

Table (1a) differences means between experimental and control group before exposing to the treatment

	VAR.	N	Mean	Std. Deviation	Std. Error Mean
Experimental and control group before treatment	Experimental gr.(A)	41	8.93	4.22	.66
	Control gr.(B)	39	8.62	3.87	.62

Table (1b) Independent samples test between experimental and control group before exposing to the treatment

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Experimental and control before treatment	.031	.862	.344	78	.732	.31	.91	-1.49	2.12
			.344	77.906	.731	.31	.90	-1.49	2.11

An examination of the table (1a,1b) reveals that t score = .344 and the significance of t α =.862 is more than the 0.05 alpha level. This means that no significant difference between the two groups before treatment, so hypotheses one is accepted.

Hypotheses two

There is no significant difference in the achievement of students who exposed to the CAI package in kitchen and food hygiene(experimental group) and those who taught the same contents using traditional method of teaching (control group).

Table (2a) differences means between experimental and control group after exposing to the treatment

	VAR.	N	Mean	Std. Deviation	Std. Error Mean
Experimental and control after treatment	Experimental gr. (C)	41	21.07	3.47	.54
	Control gr. (D)	39	16.41	3.64	.58

Table (2b) Independent samples test between experimental and control group after exposing to the treatment

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Experimental and control after treatment	.909	.343	5.863	78	.000	4.66	.80	3.08	6.25
			5.856	77.271	.000	4.66	.80	3.08	6.25

An examination of the table (2a, 2b) reveals that t score =5. 863 and the significance of t α =.000 is less than the 0.05 alpha level. This mean that there is a significant difference between the two groups after exposing to the kitchen and food hygiene package , so hypotheses two was therefore rejected.

To confirm the effectiveness of the CAIP in kitchen and food hygiene on the student using Eta-Squared η 2 (Abo Hatab &Sadek 1996) (η 2) equation $(\eta\ 2) = \frac{t^2}{t^2+df} = 30.589401\%$

This mean that there is a strong effect of the CAIP on the students' achievement.

Hypothesis three

There is no significance difference in the achievement of students (control group) before and after exposing to the educational content of kitchen and food hygiene using traditional method of teaching.

Table (3a) Paired Samples Statistics mean of experimental group before and after treatment

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Control group before treatment	8.62	39	3.87	.62
	Control group after treatment	16.41	39	3.64	.58

Table (3b) Paired sample test of control group before and after treatment

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			

Pair 1	Control group before and after treatment	-7.79	2.17	.35	-8.50	-7.09	-22.469	38	.000

An examination of the results in the table (3a,3b) showed that the t score = 22.469 and the sig of t = 0.000 is less than the 0.05 alpha level. This mean that there is significant difference between the students' scores for the control group before and after exposing to the educational content of kitchen and food hygiene using traditional method of teaching, in favour of students who are exposed to the educational content of kitchen and food hygiene package, so hypotheses three is rejected.

Hypotheses four

There is no significance difference in the achievement of students (experimental group) before and after exposing to the educational content of kitchen and food hygiene package using CAI.

Table (4a) Paired Samples Statistics mean of experimental group before and after treatment

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Experimental group before treatment	8.93	41	4.22	.66
	Experimental group after treatment	21.07	41	3.47	.54

Table (4b) Paired sample test of experimental group before and after treatment

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Experimental group before and after treatment	-12.15	4.66	.73	-13.62	-10.68	-16.685	40	.000

An examination of the results in the table (4 a,4b) showed that the t score = 16.685 and the sig of t = 0.000 is less than the 0.05 alpha level. This mean that there is significant difference between the students' scores of the experimental group before and after exposing to the educational content of kitchen and food hygiene using CAI package, in favour of students who are exposed to the CAI package in kitchen and food hygiene, so hypotheses four is rejected.

DISCUSSION OF FINDINGS

The results of the analysis showed that both sample's mean in control group (8.62± .62) and experimental group (8.93± .66) were similar in their scores before their exposure to the educational content of kitchen and food hygiene, that there were no significant difference between experimental group and control group.

So the two samples were equivalent. The results showed also that there were significant differences between experimental group (mean= 21.07); who exposed to the kitchen and food hygiene package using CAI and the control group (mean= 16.41) who exposed to the same educational content of kitchen and food hygiene using conventional method of teaching in favor of the experimental group . These findings reveal that CAI increases the learning levels of students and improves their achievement to the kitchen and food hygiene compared with traditional method of teaching and confirm the importance of using CAI in teaching.

This findings similarly agree with previous findings of Willam (1989) in hospitality management , the findings of Wilson & Sneed (2001) in a veterinary anesthesia , Basturk (2005) in statistics, Aliasgari , Riahinia &Mojdehavar (2010) in mathematics and Yusuf & Afolabi (2010) in biology.

Results reveals that the mean scores of students in experimental group before and after exposing the educational content equal 12.15 which is more than the mean scores of students in control group before and after exposing the educational content which is equal 7.79, that means that the educational content affects on both groups but the most effective way is using CAI package.

Recommendation

Based on the results of this study the following recommendations are made:

1- Necessary attention should be accorded to computer literacy, and using the CAI package method of teaching in diverse domains.
2- The importance of applied kitchen and food hygiene package to the students in different domains in the faculty and consider it as a cultural course to the other faculties because of its importance in our daily life.
3- New technologies and software featuring CAI should be implemented and used in teaching process especially for those courses which contain illustrations and stimulated software, could help students to utilize stimulated objects, concepts and problem solving.
4- To emphasis the importance of good food and kitchen hygiene practice and the need to handle and prepare food in a safe, clean environment and provides the understanding knowledge of kitchen and food management for the development of students' awareness.

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THE EFFECTIVENESS OF COOPERATIVE LEARNING ON THE READING COMPREHENSION SKILLS IN TURKISH AS A FOREIGN LANGUAGE

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ABSTRACT

Cooperative learning is a process through which students with various abilities, gender, nationalities and different level of social skills carry out their learning process by working in small groups and helping each other. Cooperative learning is a pedagogical use of small groups which enable students to maximize both their own and others' learning.

This study was carried out in order to identify the efficiency and the effects of cooperative learning techniques on the reading skills of the students who learn Turkish as a second language. A total of 40 students (20 subjects in experimental group, 20 subjects in control group), who learn Turkish as a second language at Istanbul University Language Center, participated in this study which was done in accordance with the 'pre-test post-test control group' model as one of the experimental research designs. In the experimental group, cooperative learning techniques were used for reading comprehension activities, while traditional teaching model was followed in the control group. The data were gathered through the 'Reading Comprehension Skills Achievement Test' developed by the researchers, and a number of suggestions were made to develop reading skills in teaching Turkish as a foreign language.

Keywords: cooperative learning, reading comprehension skills, teaching Turkish as a foreign language.

1. INTRODUCTION

Thanks to communication and information technologies, the disappearance of the borders with the spread of globalization, and the world's getting smaller make it necessary to learn a foreign language. In accordance with these advancements, the interest in Turkish language also increases.

Upon a boom in the interest in Turkish language, those working in the field mostly focus on how to teach Turkish more effectively or how students can learn this language on their own. In other words, the innovations in the field of education have started to be applied in teaching Turkish as a second language.

As it has already been known, teaching a language is a multidimensional task which requires different techniques and methods compared with teaching other subjects. In order to study a language either as a first or second language, one makes an effort to develop and integrate four basic skills which are listening, speaking, reading and writing. However, it is difficult to improve all these skills all at once in terms of teaching a foreign language since proficiency in learning a foreign language differs from an individual to another, whereas a native language can be learnt by all the members of a society to some extent. Therefore, it is necessary to make use of various methods and techniques which will minimize the differences within a classroom and help learners to participate in lessons equally. Cooperative learning which is the focus of this study is one of these methods which help learners to participate in lessons equally and effectively.

1.1. Cooperative Learning

As a learner-centered method, cooperative learning is a teaching method by which learners study by helping one another in small groups in their learning process in order to achieve a common objective

(Açıkgöz, 2003). Cooperative learning as a concept consists of several instructional methods in which learners study a language in small groups of 4-6, and group performance is rewarded in several different ways (Slavin, 1988).

Cooperative learning is an in-class learning approach which is used to help learners develop a positive image both for themselves and their peers, and to improve problem solving and critical thinking skills in order to encourage learners in terms of social skills based on cooperation (Gömleksiz, 1993). Cooperative learning is a learning method in which learners help each other in terms of their learning process by making up small homogenous groups to achieve a common goal; and in which group performance is rewarded in several different ways.

There are differences between learners' studying in groups and cooperative learning method. In group-work, learners can sit around a table while studying, but they cannot communicate with each other independently while studying together. Therefore, small study groups cannot affect each other positively. That's why, their communication can be considered to be individual learning. Then, in cooperative learning, learners' efforts are rewarded as a group. To illustrate, if learner groups are to do an assignment, if only one student does that whole task, and studies without the help of the others, this cannot be considered as a group work based on cooperative learning method. In cooperative learning groups, sense of responsibility means that group members should know that materials prepared by all group members are for the sake of the success of the group. The learners in these groups do not need to learn how to cooperate since teachers manages the organization and the structure of the groups (Johnson and Johnson, 2002).

In order for a group work to be a cooperative one, learners should be aware of the fact that they need to study so as to maximize the learning of both their own and their friends. In these groups, learners make an effort to maximize their own and other group members' learning since the performance of cooperative learning groups is possible only when each individual struggles for the benefit of all group members.

For a group work to be considered a cooperative learning process, following components and conditions should be taken into consideration:

1. Group reward: In order for members of a group to succeed, it is necessary for the group itself to become successful.

2. Positive interdependence: It creates a situation in which individuals make a common effort for the reward and their common goal which can in fact be possible via positive dependence, positive product dependence, and positive process dependence.

3. Individual accountability: It means that group success depends on the learning of each and every individual. Every learner has the responsibility to learn the subject and do whatever must be done.

4. Face-to-face promotive interaction: It means that group members motivate one another.

5. Social skills: It is about teaching learners how to build relations among individuals and encouraging them to use this.

6. Group processing: It is about identifying which behavior of the members benefit to the success of the group, and also which behaviors should continue and which ones should be modified.

7. The opportunity for equal success: It is about benefitting to the success of the group by developing their own behaviors and this can be achieved through a specific grading method (Açıkgöz, 1992).

In cooperative learning method, the realization of individual objectives is dependent on the overall success of the group. Therefore, the ones who want to be successful are forced to help other group members. Wilkinson (1994) states that cooperative learning enables fast learners to help respectively slow learners in terms of improving their skills. In other words, every learner struggles to develop both themselves and other group members because they are aware of the fact that the success of the group depends on the performance of each individual.

According to cooperative learning, group is a whole entity and all the members are responsible for the success or the failure of the group. As Senemoğlu (1998) quotes from Webb, Deering, and Melath, a group goal encourages learners to make an explanation in order to help their learning; to teach them learning strategies; and to communicate actively based on a theme, whereas it motivates low-level learners to ask for help. In cooperative learning groups, even though the success of the group is the focus, it should be noted that it is also based on individual performance of the learners.

1.2. Cooperative Learning Techniques

Within the framework of its basic principles, several cooperative learning techniques have been developed. Of all these, the most widely exploited techniques are presented below (Açıkgöz, 2007):

1. Learning Together
2. Academic Conflicts
3. Learners Teams
   a. Learners Teams- Achievement Divisions
   b. Team-Game-Tournament
   c. Team Pair Solo
   d. Cooperative Reading and Writing
4. Group Research
5. Co-op
6. Jigsaw I
7. Discovery
8. Jigsaw II
9. Ask Together - Learn Together

The learning techniques to be used in classroom environment need to be chosen considering lesson objectives, subject, learners' achievement levels, their skills and available amenities. If teachers and learners are not experienced in using cooperative learning techniques, they had better choose more well-structured techniques (Slavin, 1980; Yıldız, 1999).

In this study, of all those cooperative learning techniques, "Ask Together - Learn Together" is used because this technique consists of instructional tasks which help the development and evaluation of comprehension skills.

1.2.1. Technique of Ask Together - Learn Together

This technique has been developed by Açıkgöz (1990). According to Açıkgöz (1992), it is based on the principle of sheer cooperation among learners and it does not give the opportunity to do nothing. This technique gives utmost importance to positive interdependence within group, individual accountability, group processing, reward, and face-to-face promotive interaction.

In Ask Together - Learn Together Technique, the following materials could be exploited:

Reading Texts: Some excerpts or sections taken from books, stories or notes prepared by the teacher can be used as reading materials.

Question-Response Cards: These are the cards on which the questions and responses of the group and individuals might be written and its size might vary depending on the activity.

Theme Sheets: This is a paper on which important points to be considered during reading are listed.

Group Presentation Evaluation Forms: It is developed by the teacher to evaluate group presentations in terms of content and organization.

Examination: It consists of multiple choice or short-response questions which are about the subject. It must not exceed 10-15 minutes.

The following are the suggested steps to be followed while carried out the Technique of Ask Together - Learn Together:

1. Organizing groups: Groups ideally should consist of 3-4 learners. It is important to organize groups heterogeneously based on their skills, level of achievement, gender, and their socio-economic status. Finding a name for each group has a positive effect on motivating learners and attracting their attention into the lesson.

2. Reading: Each learner reads the related text or section individually and silently. The teacher might inform the learners about the important points to be considered during reading or the themes.

3. Preparation of Learner Questions: It is the step at which learners are expected to prepare questions about the reading or the themes. They write the questions on a card. The teacher grades each questions based on their level and accuracy, which is necessary to monitor the performance of each learner.

4. Preparation of Group Questions: Having prepared individual questions, members come together to prepare the group question. Learners are expected to explain the positive and negative aspects of each question to one another rather than tagging them as bad or good. In order to make sure learners' participation, learners are given roles in turns such as recorder, postman, reporter, debate leader, and invigilators or monitors.

5. Sending Group Questions: The question prepared by the group is written on a card and sent to another group chosen randomly by a student with the role of a postman.

6. Responding to Group Questions: This is another step requiring the cooperation of group members. The fact that each group has only one question card is necessary due to positive interdependence.

7. Presenting Responses to the Class: By means of spokespeople that they have chosen, the groups present their response to the question they have to the whole class. In order to guarantee the learning of everyone in the group, the spokespeople can also be chosen by the teacher rather than the group members.

8. Evaluating Group Presentations: The performance of the spokesperson is evaluated by the teacher or other students. The teacher might give a form for this; and after the evaluation process, a point is given to the spokesperson and the group.

9. Whole-class *Discussion*: After the groups have completed their presentation, the teacher can start a discussion by summarizing the subject. During this discussion, it is aimed to clarify the points that could not be focused on and not understood completely.

10. Testing: After the session is completed, all students take an exam individually. The points gathered from the exam and their presentations are summed up and a group point is measured. By comparing group points to previously defined criteria and a scale, groups are given rewards which are also decided in advance such as "very good", "good", "not bad".

2. METHOD

2.1. Design of the Study

In the present study, experimental research model consisting of pre-test, post-test with a control group was applied. Experimental group was taught through Ask Together - Learn Together, whereas control group was taught through traditional teaching methods which involve lecturing and question-response.

The experimental research model is shown on Table-1:

Table 1: Experimental Research Model

Groups	Pre-test	Experiments	Post-test
Experimental Group	Reading Comprehension Achievement Test	Cooperative Learning	Reading Comprehension Achievement Test
Control Group		Traditional Teaching	

2.2. Participants

The study was carried out at Istanbul University Language Center and subjects were chosen from the learners who study Turkish as a foreign language in Turkey. For this study, a total of 40 students who learn Turkish at B1 level according to Common European Framework, and 20 of the subjects were in experimental group, while 20 students were in the control group.

2.3. Data Collection Instruments and Analysis of the Results

The data of the study were gathered through "Reading Comprehension Achievement Test" which had been developed by the researchers. Firstly, during an 8-week period until the experimental tasks were finished the objectives and skills which had been aimed to be taught were identified and a comprehension test was developed in order to test the level of achievement. The KR coefficient of the test was calculated as .7984. In this test composed of 24 multiple choice questions, there are 6 texts 2 of which are informative; and there are also 3 stories and a poem among these texts.

The data of the study were analyzed through software package SPSS 11.00 (Statistical Package for the Social Sciences). In order to understand the efficiency of cooperative learning method, pre- and post-test results were compared and t-test scores were analyzed to see whether the differences were significant or not.

3. FINDINGS AND DISCUSSION

In order to analyze the effects of cooperative learning method and traditional teaching methods on reading comprehension skills and achievements of the students learning Turkish as a foreign language, first Reading Comprehension Achievement Test were carried out both in experimental and control groups and then the differences were compared.

Tablo 2: A Comparison of Reading Comprehension Achievement Pre-test Scores of Experimental and Control Groups

Group	N	$\bar{x}$	Ss	Sd	t	P
Experiment	20	14,15	4,46	34	0.59	0.55
Control	20	13,97	4,44			

p>.05 (insignificant)

When the mean scores of experimental and control groups (the mean score for the experimental group is 14.15; the mean score for the control group is 13.97), are compared, it can be seen that these scores are very close to each other, and the facts that there is no significant difference between the mean scores of these groups shows that groups were at a similar level of achievement at the beginning.

In order to analyze the effects of cooperative learning method on reading comprehension skills and achievements of the students learning Turkish as a foreign language, according to the Reading Comprehension Achievement Post-Test results of cooperative learning and traditional teaching method groups, their means scores, standard deviation scores were calculated and t-test was conducted.

Tablo 3: A Comparison of Reading Comprehension Achievement Post-test Scores of Experimental and Control Groups

Group	N	$\bar{x}$	Ss	Sd	t	p
Experiment	20	20,46	4,28	34	2.41	0.02
Control	20	15,27	3,88			

p>.05 (insignificant)

Table 3 shows the difference between reading comprehension achievement post-test scores of experimental and control groups. The mean score of the experimental group is 20, 46, whereas the mean score of the control group is higher than 15, 27. As a results of the statistical 2-tailed t-test results, p value is lower than .05 and the t score is 2, 41. The results show that there is a significant difference between the mean scores of the experimental and control groups and it was observed that cooperative learning method applied in experimental group has a higher effect on reading comprehension skills when compared with the effects of traditional teaching methods.

Tablo 4: A Comparison of Pre and Post-test results of Reading Comprehension Achievement Test Scores of Cooperative Learning Group

Experiment Group	N	$\bar{x}$	Ss	Sd	t	p
Pre-test	20	14,15	4,46	18	4.42	0.01
Post-test	20	20,46	3,28			

p>.05 (insignificant)

Table 4 shows that the mean scores of post-test results (20, 46) of cooperative learning group is higher than their pre-test scores (14, 15). In order to analyze the significance of the difference statistically, t-test was carried out and it shows that there is a significant difference between the mean scores of pre-test results of the cooperative learning group when it is compared with their reading comprehension achievement post-test scores. (sd=18, t-test=4,42, p<.05).

Tablo 5: A Comparison of Pre and Post-test Results of Reading Comprehension Achievement Test Scores of Traditional Teaching Group

Control Group	N	$\bar{x}$	Ss	Sd	t	p
Pre-test	20	13,97	4,44	17	1.18	0.16
Post-test	20	15,27	3,88			

Table 5 shows that the mean scores of post-test results (15, 27) of traditional teaching group is higher than their pre-test scores (13, 97). In order to analyze the significance of the difference statistically, t-test was carried out and it shows that there is no significant difference.

6. CONCLUSION AND DISCUSSION

Considering the results of the present study, it is obvious that cooperative learning is more effective in improving reading comprehension skills of learners who study Turkish as a foreign language when compared with traditional teaching methods. Moreover, the students expressed that they had fun

during experimental studies; they did not get bored since they were active during almost the whole lesson, and finally they got to know their classmates more thanks to these activities.

Since reading is a multidimensional process covering various aspects such as communication, perception and cognitive, affective and kinesthetic process (Sever, 1995), carrying out reading comprehension activities through cooperative learning strategies has helped the process to be experienced more actively.

As a consequence, following suggestions can be made:

1. In this study, as one of the cooperative learning techniques, Ask Together - Learn Together technique was used. In parallel to lesson objectives, further research could be done to analyze the effect of other cooperative learning techniques on teaching Turkish as a foreign language.

2. Cooperative learning techniques could be benefited not only in terms of reading comprehension skills but also in respect to developing other language skills such as grammar, writing, and speaking.

3. Since studies covering a short period of time is restrictive and misleading, further studies covering a longer period of time could be carried out in respect to the effectiveness of cooperative learning model.

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THE EFFECTIVENESS OF DALIL AVU ZAR zad'S METHOD TO LITERATE THE LOW-LEVEL PROFICIENCY STUDENTS IN JAWI

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ABSTRACT

This study is aimed to help students in writing Jawi and to introduce them with the better ways of identifiyng Jawi letters that cannot joint together with the next alphabet in Jawi writing system. It is also hoped that the new learning method will enhance students' interest to learn Jawi. Samples from four difference schools were chosen in this study. The primary schools' pupils are from Bukit Kalam Primary School and Pantai Primary School, Federal Territory of Labuan, Malaysia. The secondary schools' students are from Labuan Technical Secondary School, Secondary Science School of Labuan, Lajau Secondary School and Taman Perumahan Bedaun, Secondary School. The samples' level of proficiency in writing and reading Jawi script range from low to intermediate level only.

INTRODUCTION

The *Jawi* alphabetical system is a writing method that has exist for centuries in Nusantara Region amng the South East Asian country. The *Jawi* alphabets composed of Arabic Alphabets were adapted for Malay writing. It is written from right to left and has 6 more letters (sounds) not found in Arabic alphabetical system: ca, pa, ga, nga, va, and nya.

Jawi lesson is part of the Islamic Studies subject in Malaysia Education system for primary and secondary schools. The lesson can be taught to any students who are interested to learn. Because of early and sometime only exposure to the Romanic alphabetical system, the primary schools' pupils and the secondary schools' students have been found to face difficulties in learning Jawi.

PROBLEM OF STATEMENTS

Based on the pupils' performances it is found that most of the low level proficiency pupils are unable to read, to write, and to identify correctly the single letter that should be joined together when writing Jawi. The time allocated to teach this subject is only half an hour per week. The class's short duration contributes toward the pupils' inability to understand the concept in Jawi lesson. Jawi is very unique because there are many ways in spelling and joining the letters. When the pupils cannot understand these basic concepts, they will become uninterested in learning Jawi. The pupils also perceived that Jawi is not as important as English or Mathematic because it is excluded from the national examination and a very

tough subject too!. This papers come out of ways to make the subject easy and interesting. Its also want the students to place great importance in their achievement in this lesson. Each time the teacher teach the subject; they have to explain the concepts in detailed and elaborate descriptions repetitively. The non-stop lecturing made teachers exhausted and frustrated after each lesson.

Meanwhile, the text book's instructions are also not very clear and can confuse the students understanding. Exercise on joining the letters asks the pupils to join the Jawi letters. Every single letter is followed by add (+) symbol. Most of the student will join all the letters because of the add symbol, when in fact, only certain Jawi letters can be joined to another letters in the exercise.

This is an example of the text book's instruction for joining single letter Jawi.

Pupil's answer	Join the single letter below
	ل + و + ف + ا

This is the modification that made easier to follow the instruction when joining Jawi letters.

Pupil's answer	Join the single letter below
لوفا	ل + و – ف + ا

All these teaching problems and students' difficulties in learning Jawi lead to a conclusion that there is there firm but yet simple technique to explain the concept of writing and joining Jawi letters? Several techniques and approaches to get these pupils to embrace this legacy subject. After trials and errors and many modifications, finally this papers managed to establish with two techniques to solve these major issues.

First technique is named as DALIL and it is a technique that helps pupils quickly to be able to write Jawi. Second technique is AVU ZAR ZAD; a method for identifying which Jawi letter can join or remain alone. The students' performance and passing rates increase tremendously after successful implementation of these techniques. Even though, Jawi is not been considered for evaluations in the primary national examinations, it is evaluated in the Lower Secondary Examination (PMR) and Malaysian Certificate Examination (SPM). This studies hope to boost the advancement of Islamic Studies Subject in the secondary examination. At the same time it will also preserve our heritage and legacy.

FOCUS OF THE STUDY

The main focuses of the studies is on the most basic and important elements of writing and joining of the letters. The studies is to determine the effectiveness of these two techniques:

- DALIL Card:

  A technique in writing simple words in Jawi.

- AVU ZAR zAD:

  A technique in identifying which letter can be join with another

letters (using add (+) and subtract (-) symbols).

OBJECTIVE OF STUDY

General Objective

To enhance the students' proficiency in Jawi subject; this will result in improving the quality of students' performance in the Lower Secondary Examination (PMR) and Malaysian Certificate Examination (SPM) Islamic Studies subject.

Specific Objectives

The specific objectives of the studies, are as follows:

- To increase the students' interest and ability in learning Jawi.
- To enable the students to write in Jawi script.
- To enable students to identify letters in Jawi that can be join together.

SAMPLING AND TARGET GROUPS

The target groups are students with different ability level from different age sets. The first groups consisted of 10 pupils from Year 2 (8 years old with low ability), whereas the second consist of 16 pupils from Year 6 (12 years old with low ability). These two groups are under the same level of proficiency from Bukit Kalam Primary School, Federal Territory Labuan. The third group consisted of 10 pupils from of Year 4 classes Pantai Primary School, Federal Territory Labuan (low and intermediate ability 10 years old). The last group are students from secondary schools. The sampling are 55 students (low and intermediate ability teenagers) from Technical Secondary School, Science Secondary School, Lajau Secondary School and Taman Perumahan Bedaun Secondary School, Federal Territory Labuan.

RESEARCH IMPLEMENTATION

Identification of the problems

Most pupils are found to not be able to maintain concentration for the whole period of Jawi lesson. The pupils' answers in the test papers, exercises and pre-test confirmed the finding that they do not command a solid grasp on the lesson concept. Thus, unable to answer the question correctly. Pupils were also depending too much on the teachers' *spoon feeding*.

Research Implementations

The pupils in the classroom can be divided into 3 groups for teaching and learning. There are group A for high proficiency, group B for intermediate and group C for low ability. The group C pupils always left behind when it comes to grasp the concept of the lesson. This same problem faces other Jawi teachers in the class.

The study begins with pre-test to identify the weak pupils in two competencies areas. The first competency area tests the student skill in writing Jawi. They were given test that requires them to convert ten words from Roman script to Jawi script. The second test expects pupils to identify any Jawi letter that

can be joined or not. The test contains ten questions that asked the pupils to join the Jawi letters appropriately. The same test is given all the primary schools' pupils and another set of questions is prepared for the secondary schools. The pre-test conducted for the four secondary schools been carried out centralized in the Labuan Federal Territory, Education Department. The suitable students were identified during this centralized test for the study. After the test , 55 students were selected from different proficiency level to be the sample of the research. The results of the tests are as below:

Table 1: Analysis of Pre-Test Result (10 Pupils, Year 2)

Test score range	Grade	Before the aid of DALIL Technique		Before the aid of AVU ZAR ZAD	
		Number of pupils	Percentage %	Number of pupils	Percentage %
10	A	0	0 %	0	0 %
8 - 9		0	0 %	0	0 %
6 – 7	B	0	0 %	0	0 %
4 – 5	C	0	0 %	0	0 %
2 – 3	**D**	**5**	**50 %**	**3**	**30 %**
0 -1	**E**	**5**	**50 %**	**7**	**70 %**
% of passes		**0 %**		**0 %**	
% of fail		**100 %**		**100 %**	

Table 2: Analysis of Pre-test Result (10 pupils, Year 6)

Test score range	Grade	Before the aid of DALIL Technique		Before the aid of AVU ZAR ZAD	
		No. of student	Percentages %	No. of student	Percentages %
10	A	0	0 %	0	0 %
8 – 9		0	0 %	0	0 %
6 – 7	B	0	0 %	0	0 %
4 – 5	C	0	0 %	0	0 %
2 – 3	D	1	10 %	3	30 %
0 -1	E	9	90 %	7	70 %
% of passes		0 %		0 %	
% of fail		100 %		100 %	

Table 3: Analysis of Pre-test Result (Year 4, Pantai Primary School)

Range of the test score	Grade	Before the aid of DALIL Technique		Before the aid of AVU ZAR ZAD	
		No. of student	Percentages	No. of student	Percentages

			%		%
10	A	0	0 %	0	0 %
8 - 9		0	0 %	0	0 %
6 – 7	B	1	10 %	0	0 %
4 – 5	C	1	1 0%	0	0 %
2 – 3	D	0	0 %	3	30 %
0 -1	E	8	% 80	7	70 %
% of passes		20 %		0 %	
% of fail		80 %		100 %	

Table 4: Analysis of Pre-test Result Secondary Schools Students (35 students) (Before with the aid of DALIL technique)

Test Score range	Grade	Before the aid of DALIL technique	
		No. of student	Percentage %
31 – 40	A	0	0 %
21 – 30	B	1	3 %
11 – 20	C	14	40 %
0 - 10	D	20	57 %
% of passes		43 %	
% of fail		57 %	

A pretest was used to test and measure the pupils' and students' proficiency in writing and joining letters.

Analysis of the Problem Identified

According to the outcome of the test, baesd on the table below, the studies found that students have great interest in the subject. The analysis is based on the two competencies of writing and joining letters.

Table 5: Pre and Post Test Analysis of Writing Skill After Using the DALIL Technique

School / Year	% pre DALIL		% post DALIL	
	Fail	Passes	Fail	Passes
Year 2 Bukit Kalam Primary School	**100 %**	**0 %**	**0 %**	**100 %**
Year 6 Bukit Kalam Primary School	**100 %**	**0 %**	**0 %**	**100 %**
Year 4 Pantai Primary School	**80 %**	**20 %**	**0 %**	**100 %**

Combination of the 4 Secondary Schools	**57 %**	**43 %**	**17 %**	**83 %**

Table 6: Pre and Post Test Analysis of Writing Skill After Using the AVU ZAR zAD (AVZZ) Technique

School / Year	% pre AVZZ		% post AVZZ	
	Fail	Passes	Fail	Passes
Year 2 Bukit Kalam Primary School	100 %	0 %	20 %	80 %
Year 6 Bukit Kalam Primary School	100 %	0 %	0 %	100 %
Year 4 Pantai Primary School	80 %	20 %	0 %	100 %
Combination of 4 Secondary Schools	54 %	46 %	6 %	94 %

Based on the analysis shown above, these two techniques were very helpful in enhancing the student's Jawi proficiency.

IMPLEMENTATION

The low proficiency students were identified through observations, teaching and learning sessions, exercises, examination results, and pre-tests. These low proficiency students were tested at difference time. First, the study conducted a test to identify the student's writing Jawi competencies. Secondly, the students were tested on their ability to identify the Jawi letters that can be joined. After they have completed the pre-test, the answers were analysed. The answers were not discussed because the test will be conducted again as a post-test. The studies introduced the DALIL and AVU ZAR SAD techniques to the weak pupils in the remedial sessions as soon as they were identified.

DALIL Card

The students been interviewed to gauge their ability in writing Jawi. The questions are on the subject of the similarity between Jawi and Roman alphabets. For examples, the students been asked on which letter in Jawi is the same as letter 'b' in the Roman script. None of the students could answer the questions. Later, an alphabet table called DALIL CARD been distribute to the pupils. The alphabet table showed the

similarity between Jawi and Roman script. The alphabet card uses the system of alphabet arrangement based on the combination of the latest Jawi grammatical spelling.

The test process been repeated. The same questions been asked and now the students can answer them accurately!. As for the drilling, a subjective exercise been given, where the students were asked to write down the similarity for each single Jawi alphabet and Roman alphabet. Then, the students were asked to write ten simple Jawi words. After satisfied with their performance, the students been given a simple post-test exercise which consist of ten questions. The questions requires the student to convert ten simple words from Roman script to Jawi script. The stuides discovered that the students can comfortably complete their test in brief. None of the students left any questions unanswered. They answered all the questions completely. The effort is rewarded and really satisfied with the results. The studies shows that the student can just be facilitate rather than spending time giving them lecture. The student utilized the DALIL Card as a reference for the entire questions. Before DALIL Card was used as teaching aid, the pupils from primary school did not score any mark, but after they were taught to use it, their achievement increased to one hundred percent passes. Since some of the test questions for the secondary schools student are highly difficult, as it involved Jawi grammatical spelling, the secondary school students' result were only increased to forty percent.

AVU ZAR zAD

Although most of them could convert the words correctly to Jawi script but it does not mean that they can join the alphabet. What will happen if we asked them to join the letters? The students were found to join the letters without any thought about which letter can join or not. In order to evaluate the students' actual ability, we test them again with ten questions on joining letters.

From their answers, we concluded that the students did not know which Jawi letter can join or not. Immediately we began our corrective session. We introduced to the student Jawi letters that cannot join which are the letters that sound 'AVU ZAR zAD'. AVU ZAR zAD is a combination sound of Jawi letters for Alif, Va, Wow, Zai, Ro, Zal, and Dal. If there is any letter from AVU ZAR zAD is found in a word a subtract symbol (-) is placed after them. The add symbol (+) is placed after the other alphabets in Jawi which do not falls under AVU ZAR zAD.

After we introduced this technique, the students did very well in the post-test. For the primary school, their achievement increased from zero percent to hundred percent for the two classes in level two. For level one pupil, the percentage of passing score increased to eighty percent and the secondary school students passing rate swell to ninety-four percent from forty-six percent. From the analysis, we can concluded that the overall results indicate positive impact from using of two techniques to teaching aid in writing and joining the Jawi alphabets.

CONCLUSION AND SUGGESTIONS

As far as the test results are concerned, the studeise indeed very grateful because there are vast improvement in term of abilities from the pre-test and the post-test results. It shows from all the samples that have been made are remarkable improvement in their scoring. In fact, fourteen students from the

secondary schools' managed to achieve full marks (10/10) in the post-test questions, when they could only managed scores of 0 to 9 in the pre-test.

As for writing skills, the three primary schools pupils samples achieved one hundred percent scores in the post-test, where they failed to score any marks in the pre-test. These show that DALIL Card and AVU ZAR Zad techniques really help the pupils and the students. Till now our students still use the DALIL Card during the lesson. However, for some students and pupils that have already mastered the use of DALIL Card and AVU ZAR zAD techniques, they do not refer to the DALIL card or place add or subtract symbols when attempting class exercises any longer. These are suggestions to develop for future research.

- Introduce these learning techniques as early as possible to pupils who have difficulties in learning Jawi.
- Distribute the Dalil Card, so that it can be used to teach other pupils who have similar difficulties learning Jawi.

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THE EFFECTIVENESS OF LANGUAGE LEARNING STRATEGIES ON VOCABULARY LEARNING IN TEACHING TURKISH AS A FOREIGN LANGUAGE

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ABSTRACT

Learning strategies are all approaches and behavior that both an individual uses while learning and that make it easier to learn. The learning strategies that make it possible for the students to realize their own learning period increase the effectiveness of learning period. Through learning strategies it is aimed that the students follow the most effective ways in choosing, acquiring, monitoring and integrating the information that they will learn.

The aim of this study is to specify the learning strategies that the students use while learning Turkish as a foreign language and how effective these strategies are on learning vocabulary. Conducted in compliance with "pretest – posttest control group model" among experimental patterns, this study involved 40 students of Turkish as a foreign language in Istanbul University Foreign Languages Department and Istanbul University Language Center, who were divided into two groups as the experimental group and the control group, each of which consisted of 20 students. While the experimental group was subjected to the usage of strategies and strategy-oriented activities, traditional method of teaching was applied in the control group. The data of the research was gathered with "Language Learning Strategies Inventory" and "Vocabulary Success Test", was evaluated in SPSS software and certain findings and recommendations were proposed accordingly.

Key Words: Language learning strategies, teaching Turkish as a foreign language, teaching vocabulary.

1. INTRODUCTION

In recent years, a tendency in education from behavioral approach towards cognitive approach is in question. While behavioral approach deals with how a learning material influences learning, the aim in cognitive approach is to understand how information is processed and structured in memory. With the increasing interest in cognitive approach, student-centered approaches and studying the individual learning differences among students have gained importance.

In parallel with this change in educational mentality, the methods adopted by students for comprehending, learning and remembering new information have been discussed, which have resulted in an increasing interest in learning strategies.

Learning strategies are all kinds of approaches and behaviors adopted by the individual to facilitate the process of learning. According to Weinstein and Mayer (1986, 316), learning strategies are "behaviors or thoughts which affect students' processes of acquiring information, encoding it in memory and recalling it when necessary." According to Woolfolk (1998), learning strategy is 'a plan implemented to achieve the learning objectives.' In short, a learning strategy is "each of the techniques facilitating the process of self-learning for the student" (Özer, 2002: 17).

Grasping the significance of learning strategies has made these strategies available for foreign language teaching. The strategies used in foreign language teaching are named as "language learning strategies."

1.1. Language Learning Strategies

Researches on language learning strategies have started in 1960s. Determining what people with "excellent knowledge" of a foreign language have done while learning that language is the basis of the researches on this matter. For instance, Rubin (1975) recommends ensuring that language learning strategies applied by successful students are also adopted by unsuccessful students.

Language learning strategies are certain activities, behaviors or techniques adopted by students for improving their foreign language skills, internalizing, discovering and utilizing what they have recently learned, mostly in a planned way (Oxford, 1990). Wenden and Rubin (1987: 17) have defined language learning strategies as procedures, steps or plans used by students with the aim of acquiring, storing, recalling and making use of information. In other words, language learning strategies are all kinds of techniques, methods, thoughts and behaviors helpful for internalizing, recalling and utilizing a newly-learned foreign language. Looking from this point of view, it can be said that there are strategies used by every student while learning a foreign language, either with or without actually being aware of them. At

this point, the duty of the teacher is to make sure that students learn more easily and permanently by teaching students language learning strategies or by helping them choose the suitable strategies for themselves.

Students will always have to depend on teachers if they do not know what they will learn, which parts of the learning material are important and which strategies to use while learning. This situation is a substantial obstacle for the acquisition of an overall skill like knowing a foreign language. Therefore, it is necessary to teach students "how to learn." Through learning strategies, the student will become a better learner. Here, it is a job of teachers to determine the strategies which are used by students and the strategies they need, and to adapt these strategies to his/her own teaching method. In order to determine which strategies are to meet student needs or which strategies are to solve student problems, it is necessary for teachers to acknowledge the principles of teaching learning strategies.

What is aimed with learning strategies is to ensure that students follow the most effective ways of choosing, acquiring, organizing and integrating information. For this reason, teaching learning strategies and involving these strategies in course books are of utmost importance for perfect learning.

Oxford (1990) considers the purpose of language learning strategies as the development of communicational skills. Oxford (1990: 299-300) categorizes learning strategies in two basic groups as direct and indirect strategies and classifies them in 6 sub-groups:

Direct Strategies:

a. Memory Strategies: These strategies enable the transfer of information to long-term memory and recalling it for communication. E.g.: Establishing mental connections, applying to images and sounds, repetition, matching given information with movements, etc.

b. Cognitive Strategies: Used for creating mental models, revising and receiving and generating messages in target language, these are mental strategies utilized by students for making inferences out of what they have learned. Practicing (repetition, learning sound and writing systems practically, recognizing), strategies of sending and receiving messages, making appropriate predictions, building structures for inputs and outputs (such as summarizing, underlining important points) and reaching conclusions through analysis can be examples of cognitive strategies.

c. Compensation Strategies: These strategies enable students cope with difficult situations obstructing communication. Overcoming difficulties by making logical guesses, applying to native language while speaking or writing and using body language can be counted among the examples of compensation strategies.

Indirect Strategies:

a. Metacognitive Strategies: These are the strategies that allow the students to plan, organize and evaluate their own learning process. Focusing on learning by establishing connections with previously learned materials, organizing and planning the process of learning, evaluating personal process of learning can be examples of metacognitive strategies.

b. Affective Strategies: These strategies help learners control their feelings, motivation and attitudes related with learning. Reducing anxiety, encouraging or rewarding oneself, controlling his/her own emotional changes by listening to himself/herself, keeping a diary of language learning or sharing feelings with others, etc.

c. Social Strategies: These strategies are helpful for interaction with others (especially in oral communication). Asking questions, requesting someone to correct his/her mistakes, collaborating with people speaking the target language, developing empathy with people from other cultures, etc.

When sub-groups are analyzed, it is seen that all strategies, no matter whether they are direct or indirect, interact with each other. For example, a student uses social strategy while asking a question to a friend, but he needs not only to utilize his previous knowledge in order to understand the answer, but also to form a new and meaningful sentence in order to maintain the dialogue, therefore he makes use of "cognitive" and "memory" strategies. This example is significant, in the sense that it shows the close relationship between strategies.

1.2. Language Learning Strategies and Vocabulary Teaching

Teaching and improving vocabulary is a multi-dimensional task necessitating a long process, because words can be conceptualized when they are heard for the first time but they can be forgotten if they are not placed in memory steadily. Moreover, knowing and remembering the meaning of a word mostly does not mean that it is completely "learned." Scrivener (1994: 73) emphasizes that solely learning the meaning of a word is not enough for using that word by saying "In some cases, we may find it difficult to use a word in our own sentences, even though we remember that word. Therefore, the role of vocabulary in class environment is of great importance."

Researches on vocabulary improvement show that the most common strategies of learning new vocabulary are repetition and practicing. Nation (2005: 6) emphasizes that continuous repetition is necessary for ensuring that the meanings of words are learned. Rather than learning words at once, it is more effective to repeat them regularly and frequently. In the experiment conducted by Peterson on the amount of forgetting between 0-18 seconds, it is stated that information starts to be gradually forgotten right after it is acquired. While 62% of what is learned is remembered after three seconds, only 15% is remembered after eighteen seconds (Senemoğlu 1997: 276). For this reason, regular repetition is necessary for maximizing the amount of information learned. This way, information in short-term memory is transferred to long-term memory. On the other hand, repeating information "with certain intervals and through different activities" increases permanency even more (Bilen, 1999: 42). Exercises are good tools of application for this purpose. Exercises have the functions of reinforcing skills and converting them into habits (Başaran, 1996: 323).

Baddeley (1990) states that by using word cards, the connection between the form of a word and its meaning can be strengthened. Apart from the lexical meaning of a word, writing additional information on cards such as with which affixes it can be used or with which words it can form a phrase and to involve exemplary sentences related with that word makes it possible to learn the usage of that word.

Using wordlists is another strategy of vocabulary learning. Although not common today due to the fact that it is thought to cause learning only by heart, this technique is supported by researches to be helpful when effectively applied (Nation, 1995; Shillaw, 1995; Thornbury, 2002).

One of the most effective strategies in vocabulary improvement is to teach words by grouping them in mind and associating them with each other. Words are easily forgotten when they are separate and not related to a context. For instance, words related with travelling can be grouped and presented as "luggage (bavul), hotel (otel), swimming pool (havuz), journey (yolculuk), to book (yer ayırtmak), to travel (gezmek)" for teaching Turkish as a foreign language. Especially on beginner level, it is accepted that learning words with connotation technique is quick and effective and that words can be stored for a long time this way (Cook, 2001: 70). For example, while teaching the word "dip" in Turkish (meaning "bottom" like "bottom of the sea" or "bottom of the glass"), it is possible to utilize the word "deep" in English, as these words are close in terms of not only meaning, but also sound. According to Hulstijn (1997: 205), choosing connotative words which are not from the native language, but those which are from the foreign language and well-known by the student is more effective. At this point, choosing words with a similarity in terms of sound is a technique to facilitate learning and recalling. For instance, for the words "dinlemek (meaning "to listen")" and "dinlenmek (meaning "to rest")", which are mostly confused with each other by students, can be presented in a sentence such as "Ali bugün işe gitmiyor, evde müzik dinliyor ve dinleniyor." (can be translated as "Ali did not go to work today, he is listening to music and resting at home"), and a comic strip or a photo with a man resting at home with his earphones can be provided to support the example.

Another strategy utilized while teaching vocabulary is to create lexical maps. In this technique, a text harboring the words to be taught is chosen and the students are asked to determine the words which are related with each other. However, the attempt of learning words with very close meanings at once can result in confusion.

The other effective way used while improving vocabulary is trying to guess the meaning of a word. For this, clues such as the general meaning of the sentence or the text, the relationship between the sentence harboring the unknown word and other sentences, the type of the unknown word, its affixes, punctuation and conjunctions can be helpful. Once teachers teach their students how to use these clues and create awareness, students can comprehend the text without having to depend on a dictionary.

Dividing the words in the target language into roots and affixes, knowing the functions these affixes have, what kind of a meaning they add to the word and how they are used are also among vocabulary learning strategies. Teaching affixes with their meanings and functions in Turkish as a foreign language lessons will not only facilitate vocabulary learning, but also grasping the mentality of the language, as Turkish is an agglutinative language. For instance, a student knowing the meanings and functions of the affixes in Turkish will not have to check his dictionary for words such as "gözlük (glasses), gözlükçü (optician), gözlükçülük (opticianry), gözcü (spotter)" once he learns the word "göz (eye)"; he will at least know that these words are related with "göz (eye)."

Using a dictionary is also among vocabulary learning strategies. Bilingual dictionaries having the equivalents of words in the target and the native languages are commonly used on beginner level. In addition, dictionaries defining a word in the target language and offering synonyms to it, and those supported by exemplary sentences and pictures are of great benefit in vocabulary teaching.

2. METHOD

2.1. Research Model

In this research, the pretest – posttest control group model was used with the aim of specifying the learning strategies adopted by students and measuring the differentiation between the situations before and after learning strategies are taught. In accordance with this model, two groups were created as the control group and the experimental group. Certain processes of measurement were conducted in each group before and after the experiment.

Table 1: Experimental Pattern:

Group	Tests and Scales	Experimental Pattern	Tests and Scales
Experimental group	Language Learning Strategies Scale Vocabulary Success Test	Teaching language learning strategies	Language Learning Strategies Scale Vocabulary Success Test
Control group	Language Learning Strategies Scale Vocabulary Success Test	Traditional teaching	Language Learning Strategies Scale Vocabulary Success Test

In this study, the experimental group received language learning strategies education, while the control group was taught without language learning strategies education. The strategies applied on the experimental group are: Predicting the meaning of a word, asking the synonym/antonym of a word, associating the word with its pieces, creating concept maps, repeating the word orally and by writing, utilizing songs and advertisements in the target language, dividing the word into its root and affixes, underlining the unknown word, connotation, composing word lists and keeping a vocabulary notebook.

2.2. Universe and Sampling

The universe of this research is constituted by students learning Turkish in Turkey as a foreign language, whereas the sampling consists of 40 students studying in Istanbul University Language Center and having B2 level in accordance with European Language Portfolio, 20 of which were involved in the experimental group, while the other 20 were in the control group.

2.3. Data Gathering Tools and Data Analysis

The data in this study was gathered with "Language Learning Strategies Scale", which was developed by Rebecca Oxford (1990) and translated and adapted to Turkish by Demirel (2007), and with "Vocabulary Success Test", which was developed by the same researcher. Vocabulary Success Test involves the meaning and the usage of 20 previously untaught words which existed in the topics to be covered in the following 3 weeks, the time period necessary for the experimental procedures to be accomplished.

The data of this research was analyzed via SPSS 11.00 software. For all the statements in Language Learning Strategies Scale, the options "Completely Agree (5)", "Agree (4)", "Undecided (3)", "Disagree (2)", and "Completely Disagree (1)" were used. In Vocabulary Success Test, knowing the meaning of a word and using the word in a sentence were separately awarded with 1 point each.

3. FINDINGS AND COMMENTS

The number of questions and the strategy groups assessed by each chapter of Language Learning Strategies Scale (Oxford, 1990) used in this research were given in Table 2.

Table 2: The Strategy Groups in Language Learning Strategies Scale

Chapter A	10 questions	Memory Strategies
Chapter B	10 questions	Cognitive Strategies
Chapter C	10 questions	Compensation Strategies
Chapter D	10 questions	Metacognitive Strategies
Chapter E	5 questions	Affective Strategies
Chapter F	5 questions	Social Strategies

The average values of pretest strategy usage for the students in the experimental and the control groups are given in Table 3.

Table 3: The average value of pretest strategy usage for the experimental and control groups

Group	Strategies	X	Group	Strategies	X
Experimental	Memory Strategies	3.20	Control	Memory Strategies	3.22

Group	Cognitive Strategies	3.12	Group	Cognitive Strategies	3.11
	Compensation Strategies	2.92		Compensation Strategies	2.74
	Metacognitive Strategies	3.30		Metacognitive Strategies	3.32
	Affective Strategies	2.27		Affective Strategies	2.81
	Social Strategies	3.26		Social Strategies	3.21
	Total	3,01		Total	3,06

By examining Table 3, it can be seen that the students in both the experimental and the control groups used metacognitive, social and memory strategies most, that they utilized compensation and affective strategies less frequently, and that the average values of strategy utilization of the experimental and the control groups are close. Additionally, it is understood that before the experimental procedures, students in both groups make use of these strategies on a medium level.

The average values of posttest strategy usage for the students in the experimental and the control groups are given in Table 4.

Table 4: The average value of posttest strategy usage for the experimental and control groups

Group	Strategies	X	Group	Strategies	X
Experimental Group	Memory Strategies	3.71	Control Group	Memory Strategies	3.20
	Cognitive Strategies	3.74		Cognitive Strategies	3.18
	Compensation Strategies	2.98		Compensation Strategies	2.80
	Metacognitive Strategies	3.87		Metacognitive Strategies	3.38
	Affective Strategies	2.96		Affective Strategies	2.87
	Social Strategies	3.61		Social Strategies	3.08
	Total	3.47		Total	3.08

When Table 4 is examined, it is visible that at the end of the experimental process during which strategy education was given, differences in the average values of strategy utilization of the students in the experimental group appeared. Strategy utilization average of the students before the application, which was 3,01, increased up to 3,47 at the end of the experiment. On the other hand, no significant difference was witnessed between the average values of strategy utilization of pretest and posttest conducted on the control group (pretest: 3,06, posttest: 3,08).

In Vocabulary Success Test, knowing the meaning of a word and using the word in a sentence were separately awarded with 1 point each. Accordingly, the highest point that a student can get from a success test involving 20 words is 40.

Pretest and posttest results of the students in the experimental group in Vocabulary Success Test are given in Table 5.

Table 5: Pretest and posttest results of the experimental group in Vocabulary Success Test

	N	X	Sd	t	p
Pretest	20	19,21	4,96	5,98	.000
Posttest	20	30,16	6,28		

(P<0.05)

The average success value of the students in the experimental group, which was 19,21 before the application, increased up to 30,16 at the end of the experiment. According to this, it can be said that a statistically significant difference between pretest and posttest results of the experimental group in Vocabulary Success Test came out.

Pretest and posttest results of the students in the control group in Vocabulary Success Test are given in Table 6.

Table 6: Pretest and posttest results of the control group in Vocabulary Success Test

	N	X	Sd	t	p
Pretest	20	21,78	4,96	1,44	.17
Posttest	20	25,09	6,28		

(P>0.05)

The average success value of the students in the control group, which was 21,78 before the application, was observed to be 25,09 at the end of the experiment. Accordingly, there is no statistically significant difference between pretest and posttest results of the control group in Vocabulary Success Test.

4. CONCLUSION AND RECOMMENDATIONS

In this study, which was conducted with the aim of determining the learning strategies adopted by students learning Turkish as a foreign language and the efficiency of these strategies on Vocabulary, following conclusions were achieved:

1. It was seen that the students utilized language learning strategies on a medium level.
2. The students in the experimental and the control groups used metacognitive, social and memory strategies most, whereas they utilized compensation and affective strategies less frequently.
3. It was observed at the end of the application that the average value of strategy utilization of the experimental group, which received strategy education, increased.
4. A significant difference between the pretest and the posttest results of the experimental group, to which strategy education was given, was witnessed.

In the light of these conclusions, following recommendations can be made:

1. It is necessary to decrease the level of student dependency on teachers by teaching them learning strategies.
2. Language learning strategies should be used not only for vocabulary teaching, but for teaching all dimensions of a language.
3. Students should be guided to choose which strategies to use on their own and to organize their own processes of learning individually.
4. Language learning strategies should be taught as a separate lesson in academic divisions where foreign language teachers are trained.
5. Studies covering a longer period of time should be conducted on the efficiency of strategy education, as short-term studies may be deceptive.
6. Further research on the utilization of foreign language learning strategies, which has been extensively investigated for teaching English, should also be conducted for teaching Turkish as a foreign language.

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THE EFFECTS OF TEACHER CHARACTERISTICS, BELIEFS AND CONTEXTUAL FACTORS ON TECHNOLOGY INTEGRATION AMONG MALAYSIAN SCHOOL TEACHERS: A PROPOSED RESEARCH FRAMEWORK

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ABSTRACT

This paper describes a proposed study to investigate factors affecting technology integration among Malaysian school teachers, namely, teacher characteristics, teacher beliefs, and contextual factors. This paper will mainly focus on the relevant literature review pertaining to teachers' technology integration. From the review of literature, there is no path analysis study on technology integration in Malaysia. Therefore, in order to explain the complex relationship of factors affecting teachers' technology integration, Structural Equation Modeling (SEM) methodology will be applied in this proposed study. A path analysis was derived from the review of the previous studies that indicate the factors affecting teachers' technology integration. A stratified random sampling will be applied and the data will be analysed using Analysis of Moment Structure (AMOS). The findings are expected to reveal numerical importance of all direct, indirect and mediated factors on teachers' technology integration simultaneously.

Introduction

The use of media in Malaysia's education system started early in the 1940's with the launched of Educational Radio in 1946 and the Audio-Visual Section in education was developed in 1949. Nevertheless, tremendous effort by the government to immerse technology in the education system begun with the launched of the nation's proudly Multimedia Super Corridor (MSC) which was conceptualized in 1996 to leapfrog Malaysia into the information age. Through this project, Smart Schools Initiative was launched in 1997 and then followed with other ICT initiatives (for instance: Piloting of Smart School in 1999; Computer Lab Initiative in 2000; Computer Literacy Program in 2002; English for Teaching Mathematics and Science in 2003; SchoolNet Initiative in 2004; In-service Courses for Smart School Teachers in 2006; Information and Communication (ICT) in Education Program in 2007; Eduweb Television portal in 2008) to ensure teachers and students will benefit from the advancement of technology in education.

Within years of implementing various technology initiatives in Malaysian education system, most of the findings in teachers' level of ICT knowledge and skills were still low (Mahmud, Ismail, Mohd Yasin, Mustapha & Din, 2006; Mahmud, Ismail, Sahid & Yazid, 2007). Although several researchers reported that teachers' attitude towards ICT were positive (e.g.: Sa'ari, Wong & Roslan, 2005; Sharif & Buntar, 2005), teachers' level of technology integration was still low (Ismail, Zakaria & Aziz, 2007). Furthermore, despite numerous studies in Malaysian context on in-service teachers' technology integration in teaching and learning (e.g.: Mohd Salleh, Mohd Nordin & Mohd Jelas, 2008; Mahmud, et al. 2007; Othman & Baki, 2007; Wahab & Kaur, 2006), there are no studies on the direct and indirect effects of certain factors on technology integration that have been carried out and reported. The only path analysis study in Malaysian context that has been conducted was among female pre-service teachers (Wong & Teo, 2009) on their behavioural intention to use computers. The path analysis approach provided by applying Structural Equation Modeling (SEM) technique would enable a systematic analysis towards the factors affecting technology integration. According to Byrne, "...there are no widely and easily applied alternative methods for modeling multivariate relations, or for estimating point and/or interval indirect effects; these important features are available using SEM methodology" (2001, p. 4). Therefore, instead of merely providing a list of significant factors, the resulting model of this proposed study will reveal the importance of each factor in terms of its direct, indirect and also mediated effects toward technology

integration. Additionally, this proposed study which covers a nationwide sample will provide an insight on technology integration among Malaysian school teachers as a whole.

Literature Review

In order to fulfil the need of competent teachers in utilising technology in teaching and learning activities, the foundation of educational technology is introduced to the pre-service teacher programs in the teacher training institutes and universities. Masood (2010) has carried out an initial comparative study to compare the educational technology courses for training teachers at Malaysian universities. The study focused on four higher institutions, namely, Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM), and Universiti Malaysia Sabah (UMS) that aimed to compare and analyse the curriculum and strategies in these four universities to the revised International Society for Technology in Education's (ISTE's) 2008 National Educational Technology Standards for teachers (NETS•T). The findings indicated that the practical aspect in integrating technology in the actual classroom should be more emphasized to provide pre-service teachers with the skills and confidence in using technology besides the theories and knowledge. Furthermore, Jamiat, Umar and Masood (2010) carried out a content analysis to investigate the research trends in Malaysian teacher education. The analysis was limited to the latest five proceedings from the conventions organised by the Malaysian Educational Technology Association (META). From the analysis, the researchers revealed that the trend in Malaysian teacher education was focused on investigating pre-service teachers' involvement in technology enhanced learning environment (e.g.: Modular Object Oriented Dynamic Learning Environment (MOODLE), wikis and mobile learning). The findings showed that the country is on the right track by focusing technology enhanced learning tool as there is a need to discover and explore new technologies to be integrated in teaching and learning. The above descriptions indicated that Malaysian pre-service teachers were exposed to the current technology in education and they are also given sufficient training and support to implement technology in their future teaching and learning practices.

In addition, numerous studies pertaining to Malaysian teachers' technology integration have been reported. For instance, a study conducted by Mohd Salleh, Mohd Nordin, and Mohd Jelas (2008) among 125 Smart School teachers reported that their technology integration were still at the moderate level. Meanwhile, in order to describe the commonalities and differences in Science teachers' technology integration between Malaysian Smart Schools and mainstream schools, Ong and Ruthven (2007) carried out a survey and interviewed Form Three Science teachers from these two types of schools. The findings showed that the level of ICT use among Smart School teachers were higher than the Science teachers in the mainstream schools. Another finding on the Smart School Initiative research indicated that ICT facilities provided in Smart Schools have really helped the teachers to enrich their teaching practices and transform the traditional method to a more technology-supported learning environment (Fong, Muniandy, Atan & Idrus, 2006).

Furthermore, Ismail, Mahmud, Sahid and Yazid (2007) have conducted a research among 31 secondary school teachers teaching Malay Language to investigate their skills through three different aspects, namely, knowledge, attitude and performance in using World Wide Web as their teaching tool. The results revealed three significant relationships between factors which are knowledge with skills, experience with skills and knowledge with attitude. Othman and Baki (2007) have also investigated Malay Language teachers' technology integration by focusing on the use of computers in their practices. The results indicated that most of the teachers have the skills and concept of teaching language in a technology supported environment as they have received ICT training before. However, most of the findings also reported that although teachers have the knowledge and skills to integrate technology in classrooms, they were reluctant to embrace ICT in their teaching and learning activities because of several barriers such as heavy administrative and teaching workload (Alias & Chung, 2007; Wahab & Kaur, 2006), uncomfortable in using technology (Othman & Baki, 2007) and lack of support and guidelines for teachers to manage and implement technology initiative (Alias & Chung, 2007). However, this review of technology integration studies in Malaysia has revealed that no path analysis studies have been carried out.

As most of the previous studies have investigated the direct effect of certain factors on technology integration or practice in the classrooms, there are also studies that attempted to describe the direct and

indirect effects of variables on technology integration. For instance, Mathews and Guarino (2000) developed a path model to assess the affect of four teacher-level factors, namely, gender, academic degree, years of experience and school level on computer usage. The findings revealed that gender, years of experiences, number of computers and computer ability had a significant direct effect on computer usage. Meanwhile, Van Braak, Tondeur, and Valcke (2004) created a path model to investigate the complex relationships between demographic factors, computer experiences variables and attitudinal variables towards two types of computer use. They reported that teachers with more years of computer experiences, training and frequent computer users used computer intensively for professional support. Nevertheless, the model proposed by Mathews and Gurino (2000) and Van Braak et al. (2004) were only involved on teacher-level factors and lacked of school-level factors (e.g.: access and support).

Robinson (2003) has created a model to illustrate the relationships between variables that affected the actual usage of computer. This model which was adapted from the Technology Acceptance Model proposed by Davis in 1989 consists of teacher-level factors (demographic variables) and school-level factors (external-support variables). One of the studies conducted geographically close to Malaysia was conducted by Mohd Salleh (2005) in Brunei. Mohd Salleh (2005) proposed an adopted model of Theory of Planned Behavior (TPB) by Ajzen in 1985 which was Information and Communication Technology Use Model (ICTUM) to investigate the direct and indirect effects of internal and external factors affecting technology use among teachers. This adopted model aims to investigate the direct factors (teachers' attitudes, subjective norms, and perceived behavioural control), indirect effects (behavioural beliefs, normative beliefs, and control beliefs) and external factors (age, sex, subject taught, teaching experience, teaching periods, qualifications, teaching level, class access, and computer laboratory access) that might affect teachers' intention and behaviour on using ICT in their teaching. Another path analysis model that included school-level factors was conducted by Inan and Lowther (2010). The findings indicated that only teachers' readiness, teachers' beliefs, and computer availability had a significant positive direct effect on technology integration. Meanwhile, Chen (2010) as well as Wong and Teo (2009) have also applied path analysis technique to investigate technology use. The samples of their studies were pre-service teachers who have yet to integrate technology in the real teaching and learning environment.

Although it was obvious that the review of path analysis approach concerning factors affecting technology integration is nothing new, the explanation on ICT use in these analyses is too general. No detail or specific sub dimensions of ICT use such as Internet use, general computer use of the purpose of using certain type of technology in teaching and learning have been reported. Thus, this proposed study intend to look into detail how these sub dimensions of technology use, namely, in teachers' technology use in their teaching and learning processes, management tasks and communication. Additionally, the proposed study attempts to address the direct and indirect effects of factors influencing technology integration specifically in Malaysia as there is no path analysis study on technology integration has been carried out. Furthermore, this study will form a basis for more local study on path analysis in education. It is hoped that the findings from this study will enable the school administrators and Malaysia's Ministry of Education to provide certain support and development needed to increase the driving forces and reduce the factors that inhibit technology integration.

According to Bandura (1977), "...psychological functioning is a continuous reciprocal interaction between personal, behavioural, and environmental determinants" (p. 194). In this particular study, personal factors (teacher characteristics and teacher beliefs) and environmental factors (contextual factors) will be indentified as the indicators impacting the teachers' behaviour (technology integration). The path model in this proposed study was derived from the previous studies that indicate the factors affecting teachers' technology integration. The literature that supports the developed path analysis model is depicted in Figure 1. Based on the model, it is indicated that there are direct and indirect effects from the factors that affect the technology integration. *Teacher characteristics* (Goos & Bennison, 2006; Still, 2006; Hughes, 2005), *teacher beliefs* (Tasouris, 2009; Goss & Bennison, 2006; Angers & Machtmes, 2005; Baylor & Ritchie, 2002; Windschilt & Sahl, 2002; Cuban, Kirkpatrick & Peck, 2001; Figg, 2000) and *contextual factors* (Hall & Hord, 2006; Goos & Bennison, 2006; Angers & Machtmes, 2005; Mumtaz, 2000; Kent & McNergney, 1999; Dwyer, Ringstaff & Sandholts, 1989) are hypothesized to have direct effects towards *technology integration*. In addition, *teacher characteristics* (Nagamine, 2007; Still, 2006; Hughes, 2005) is hypothesized to have direct effects towards *teacher beliefs*. Therefore, the indirect effect of *teacher characteristics* towards *technology integration* is hypothesized to be causal to *teacher beliefs*. Also, *teacher beliefs* are hypothesized as the mediating variable in this study.

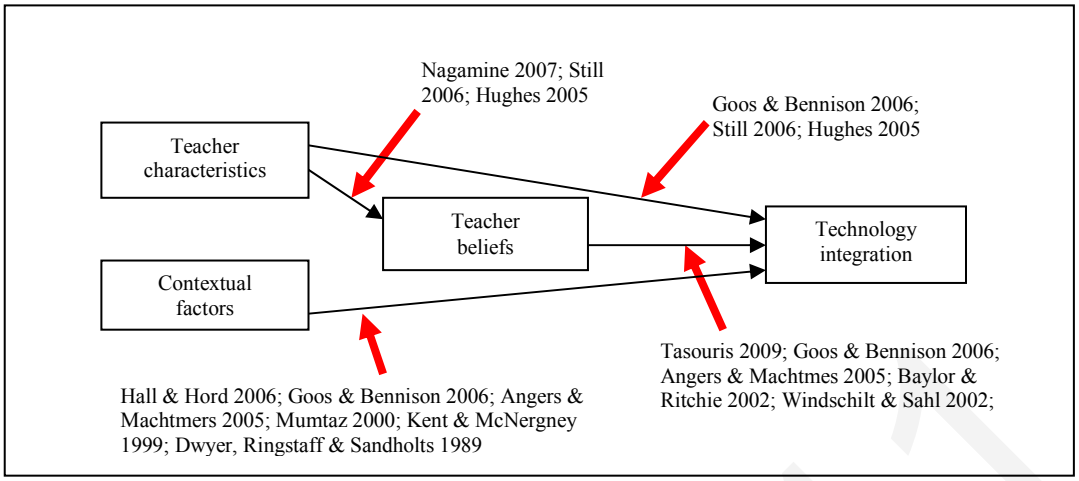

Figure 1: Literature supporting the hypothesized path analysis model

Methodology

This study will adopt the Structural Equation Modeling (SEM) methodology to evaluate the direct and indirect effects of three identified factors: (a) teacher characteristics, (b) teacher beliefs and (c) contextual factors towards technology integration. This technique will enable the researchers to provide empirical evidence that exhibit the relationships among the factors and also to determine if the causal relationships implied by the model structure fit the actual relationships given by the data collected. The population for this research will be school teachers throughout Malaysia. A stratified random sampling will be applied to select the sample for this study. Firstly, the administrative zones of all the states in Malaysia will be identified to attempt fairness in selecting the schools according to the number of schools located in the zones. The identified zones are Northern Zone; Eastern Zone; Southern Zone; Central Zone and East Malaysia. The schools will be randomly selected from each zone according to their locations (either rural or urban). Also, there are three types of school identified in this study, namely smart schools, non smart secondary schools and primary schools. From the random stratified sampling, a total of 192 secondary schools and 154 primary school teachers will be selected. Besides these schools, 20 smart schools will also be involved. A total of 20 teachers from each school will be selected as the respondents to participate in this study. Hence, it is expected that there will be more than 7,000 teachers involve in this study. A pilot study has been carried out to estimate the reliability of the questionnaire among 59 teachers and it was found that the instrument has a reliability of 0.882. The questionnaire will be administered to teachers after securing the approval to conduct this research from the Education Planning and Research Department (EPRD) at the country's Ministry of Education and every State Education Department. The data collected will be keyed-in using SPSS 18 and analysed using AMOS 18.

Expected Outcomes

According to Byrne (2001), the primary interest in SEM is the extent to which a hypothesized model adequately describes the sample data. Therefore, based on AMOS 18 model summary, the chi-square (X^2) value is provided as a quick overview of the model fit. This model fit determines the degree to which the hypothesized path analysis model proposed in this study fits the sample data. Therefore, in order for the proposed model not to be rejected, there is certain goodness of criteria: (1) Discrepancy/degree of freedom (CMIN/DF), (2) Comparative fit index (CFI), (3) Normed fit index (NFI), (4) Tucker-Lewis index (TLI) and (5) Root-mean-square error of approximation (RMSEA) need to be fulfilled and this will eventually show how well the model will perform in the future (Raykov & Marcoulides, 2000).

Based on the literature review, it is expected that: (1) teacher characteristics will significantly influence their beliefs in technology integration, (2) teacher characteristics will also significantly affect their technology integration, (3) contextual factors will significantly influence teachers' technology integration, (4) teacher beliefs will significantly have direct effects on their technology integration and (5) teacher characteristics will significantly affected their technology integration indirectly as teacher beliefs will be the mediated factor.

Conclusions

This paper has reviewed and established the need to study technology integration in teaching practices. In specific, the direct and indirect effects of *teacher characteristics* (age and teaching experiences), *contextual factors* (access and training), and *teacher beliefs* (perceived usefulness) on *technology integration* (teachers use of technology in teaching and learning, management task, and communication) need further investigation, specifically in the Malaysian context. The findings of this study will provide valuable information for the school administrators and the Ministry of Education to determine current technology resources and practices. For instance, the data would indicate the best predictors in technology integration that will be useful for developing and planning of future in-service training to improve their technology integration in teaching and learning.

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THE EFFICACY OF E-LEARNING MANAGEMENT SYSTEM ON PERFORMANCE OF RURAL SCHOOL - A CASE STUDY

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ABSTRACT

Technologies are available for education in various forms now. One primary task involves determining how best to utilize available technology resources to enhance student learning. Technology is getting popular in schools because educators believe it can improve students' learning. Besides evaluating the academic performance of students there is a need for evaluating the overall performance of students. Here comes the electronic learning management system (e-LMS) and related technologies. e-LMS, the basic description is a software application that automates the administration, tracking and reporting of learning events. The e-learning which is integrated into the LMS software, has the ability to document the knowledge levels of the individual student. This documentation of the student is analyzed and reported periodically to their parents. This is highly useful in determining the overall academic performance of the student. This study aimed to know the facts and effectiveness of e-LMS among the school students. From the study, the effectiveness of e-LMS is high. The absenteeism ratio has declined. This in turn reflected in the academic performance of the students since they have no other option than sustaining with the learning. Overall performance of a student is significantly increased. The effectiveness of e-LMS may be improved from the following suggestions: Reporting in regional languages; Web based reporting; Interactive communication; Touch screen information kiosk integrated with e-LMS for reporting. The system has positive impact among the students. This will prove very effective when implemented in large scale.

INTRODUCTION

Today, educators are facing with many new challenges and responsibilities. One primary task involves determining how best to utilize available technology resources to enhance student learning. Technology is popular in schools because educators believe it can improve student learning by providing: a more active learning, more varied sensory, conceptual modes, less mental drudgery, learning better tailored to individuals and better aid to abstraction. Besides evaluating the academic performance of students there is a need for evaluating the overall performance of students. Here comes the electronic learning management system (e-LMS).

While there are several definitions of a e-LMS, the basic description is a software application that automates the administration, tracking and reporting of learning events. Generally, the e-learning content provided in schools will be having generic topics, out of which the topic which syncs with text book curriculum has been taught. Now the trend has changed, e-learning contents which exactly based on curriculum are designed by several e-learning vendors. Since it completely synchronizes with the textbook curriculum, it is now being followed in many institutions. The e-learning content, which is integrated into the LMS software, has the ability to document the knowledge levels of the individual student on the subjects. This documentation of the student is analyzed and reported periodically to their parents. This documentation is highly useful in determining the overall academic performance of the student. The e-LMS software will be connected to a Biometric cum Access card scanner device. When the students punch their fingers in the biometric device, automatically the student's in-time at school will be sent as Short Message Service (SMS) to their parents. In the evening their out time will be sent as SMS to their parents. This helps to inform the parents about their children's whereabouts. Since the academic performance of a student is documented periodically, the e-LMS would have a database of marks scored by the students of all classes in their monthly tests and term examinations. These marks will be reported to parents through SMS, instead of report cards or progress reports.

e-LMS range from systems for managing training and educational records, to software for distributing courses over the Internet with features for online collaboration. Some e-LMS are web-based to facilitate access to learning content and administration. E-LMSs are used by regulated industries for compliance training. It is also used by educational institutions to enhance and support classroom teaching and offering courses to a larger population of learners across the globe. Some E-LMS providers include "performance management systems", which encompass employee appraisals, competency management, skills-gap analysis, succession planning, and multi-rater assessments.

A learning content management system (LCMS) is a related technology to the learning management system, in that it is focused on the development, management and publishing of the content that will typically be delivered via an e-LMS. An LCMS is a multi-user environment where developers may create, store, reuse, manage, and deliver digital learning content from a central object repository. The e-LMS cannot create and manipulate courses; it cannot reuse the content of one course to build another. The LCMS, however, can create, manage and deliver not only training modules but also manage and edit all the individual pieces that make up a catalog of training. These assets may include media files developed in other authoring tools, assessment items, simulations, text, graphics or any other object that makes up the content within the course being created. An LCMS manages the process of creating, editing, storing and delivering e-learning content. Besides reporting the academic performance of the students, Extra-curricular and other disciplinary issues of the students are also evaluated, documented and reported to their parents. With this, the e-LMS software documents and reports the overall performance of a student.

e-LMS is an upcoming method in educational institutions to provide overall analysis of students. In Tamil Nadu some of the schools started to use e-LMS to give holistic education. At present, evaluating a student on the basis of his academic performance is no more valid. An overall assessment is needed to guide the student in developing individual competencies. The e-LMS plays an important role in overall assessment of a student. The aim of this study is to study the effectiveness of e-LMSs on the performance of rural high school students. Objectives of the study are: To study the implementation of e-LMS; to analyze the effectiveness and overall performance of e-LMS among high school students.

REVIEW OF THE LITERATURE

Many literatures supported that the electronic learning (e-learning), e-LMS are highly suitable for the educational development. Some of the literatures are cited for reference. Students who used computers and incorporated constructive strategies reported significantly higher scores. Review on studies related to technology and student achievement, positive and significant gains for students who were engaged in technology-rich environments. Those students showed significant gains and achievement in all subjects, increased achievement and improved attitude toward their own learning, and increased self- esteem.

According to Stephenson (2001), online interactive learning environments appear to provide a perfect forum for an academic discourse that promotes increased student engagement, critical analysis and reflection, and the social construction of knowledge. Rudestam et al, (2002) explains that online learning solutions can provide more collaboration and interaction with peers and experts as compared to traditional instruction. Kear & Heap (2007) explains that the e-learning environment, computer conferencing including discussion forums provides a framework for peers or student to student interaction and learning. The learning process is aligned with a more constructivist view of learning where knowledge is not seen as transferred from one person to another but rather the learner is actively taking part in the learning process. Keengwe, et al (2008) established the relationship between computer technology use and student learning with conflicting outcomes. Christine Spratt and Paul Lajbcygier (2009) opine that the LMS is improving the performance of the studnets. A 12-year meta-analysis of research by the U.S. Department of Education found that higher education students in online learning generally performed better than those in face-to-face courses.

Both globalization and computer communication technology have caused and resulted in the growth of each other; they have emerged as two sides of the same coin and have impacted one another in complex and

multiple ways. New trends in education have also come about, and new challenges have been thrown up to reckon. At the same time there is an indisputable need to maintain continuity, change and growth, all at once. With the information obtained from the literatures there are many advantages in the Learning Management systems.

METHODOLOGY

Survey, Comparative analysis and expert interview methods were used to study and find out the effectiveness of e-LMSs on performance of rural high school students. In this study, the survey is conducted to find the influence of the e-LMS and to check the student's status in using this learning management system. Comparative analysis is carried out to compare the older manual recoridng method with the e-LMS. Expert interview is done to use their valuable suggestions to make this learning management system more effective.

The e-LMS which is studied in this research is implemented in a rural school viz., Selvam Matricuation Higher Secondary school which is located in Arakkonam, 65 km North West of Chennai, India. The total strength of school is 1100. The e-LMS system was implemented in the campus on October 2009. A of now, the e-LMS system is used in the classes from sixth standard to twelfth standard. The total strength from sixth to twelfth standard comprises of 600 students. Out of which three classes i.e., from sixth to eighth standards are taken into the study.

Regarding to the survey method, purposive sampling method will be used in this research. The class will be divided in to three categories based on their academic performance. The three categories are below average, average and above average students who score below 35 marks, 35 marks to 75 marks and above 75 marks out of 100 respectively. Five to six students were selected from each category in the three classes, which are sixth, seventh, and eight standards. Parents of the selected students and teachers who handled these three classes are selected for the survey. The total sample size is 120. This comprises of 50 students, 50 parents and 20 teachers. For the comparative analysis e-LMS documentations of each student were compared and analyzed with previous manual documentations. The main sources for manual documentations are progress report cards, in which the overall performance of a student's is documented thrice a year at the school. Expert interview is done to find out the e-LMS more effective.

RESULTS AND DISCUSSION

The collected data through survey from the respondents, manual records and e-LMS documents from the secondary sources and in-depth interview are processed and analyzed in accordance with outline laid for the purpose at the time of developing research plan.

Evaluation & Documentation of Academic Performance

The e-learning content which is integrated into the e-LMS software has the ability to document the performance levels of the individual student on the subjects. This documentation of the student is analyzed and reported periodically to their parents. This documentation is highly useful in determining the overall academic performance of the student. If students' performance dipped, it would be taken note of by the school authorities and remedial measures will be initiated.

Reporting Academic Performance, Daily Attendance and Disciplinary Issues

Since the academic performance of a student is documented periodically, the e-LMS software would have a database of marks scored by the students of all classes in their monthly tests and term examinations. These marks reported to the parents through SMS. Instead of reporting the marks by report cards or progress reports, this SMS reaches instantly and this will kept as record by the parents. The E-LMS software connected to a Biometric cum Access card scanner device. When the students punch their fingers in the biometric device,

automatically the student's in-time at school sent as SMS to their parents. In the evening their out time sent as SMS to their parents. This helps to inform the parents about their children's whereabouts. Besides reporting the academic performance of the students, Extra-curricular and other disciplinary issues of the students are also evaluated, documented and reported to their parents. With this, the E-LMS software documents and reports the overall performance of a student.

Survey

The data collected from the students, parents and teachers are presented here.

Subjects difficult to understand by the students and Interested subjects for the Students

Data shows that Chemistry is the most difficult subject to study (30%) followed by Biology (24%) and Mathematics (18%) by the students of the school (see the table 1). Data also revealed that Physics is the most interested subject to study by the students followed by Social Sciences. Biology and Chemistry are considered as less interested subjects.

S.No.	Subjects	Difficult Subjects		Interested Subjects	
		No. of Students	Percentage	No. of Students	Percentage
1	Physics	8	16%	15	30%
2	Chemistry	15	30%	6	12%
3	Biology	12	24%	7	14%
4	Mathematics	9	18%	10	20%
5	Social science	6	12%	12	24%

Table 1 Subjects difficult to understand by the students and Interested subjects for the Students

Usefulness of Courseware and Students

It was found that except languages all the other subjects are taught through courseware. Equal importance has been given to all subjects like Physics, Chemistry, Mathematics, Social Sciences, Biology, etc. Regarding to the usefulness of courseware, 70% of students told that courseware makes them to easily memorize the subjects. 27% of the students told it increases their understanding level and 3% of students said that it helps to increases the knowledge level of the particular subjects.

Absenteeism after implementing the E-LMS system

The biometric device was integrated into the E-LMS on October 2009. Attendance of the students will be sent to their parents daily. From the secondary data, it was found that after implementing the biometric system the absenteeism has gone down (see figure 1).

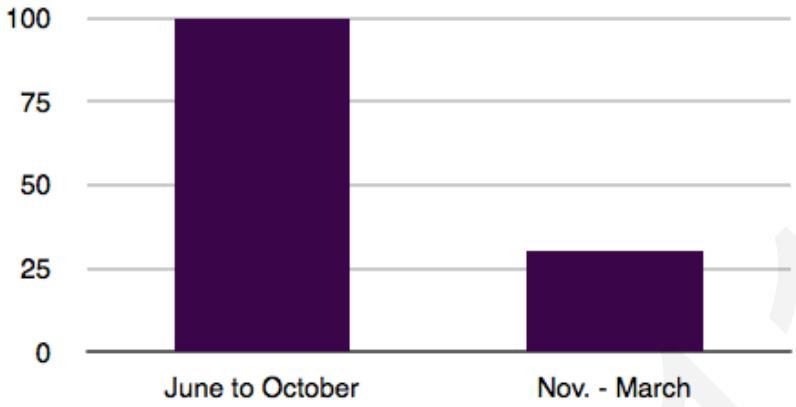

Figure 1 Absenteeism after implementing biometric attendance system

Absenteeism and academic performance

From the data, absenteeism is indirectly proportional to the academic performance of the students. When the absenteeism is decreases, the academic performance of the students is increases (see the figure 2).

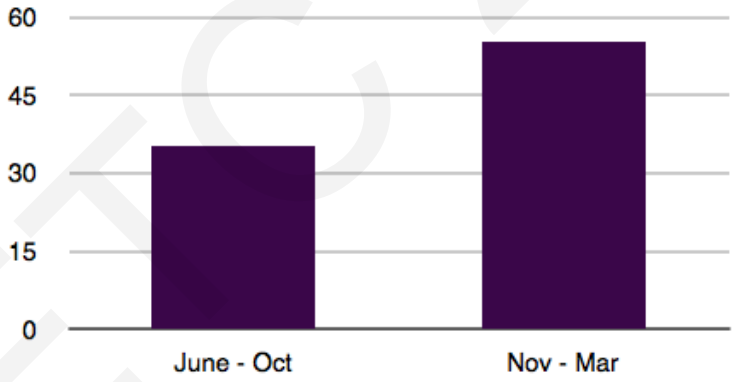

Figure 2 Representing the absenteeism and academic performance

Parents and Teachers with e-LMS System

Most of the parents (98%) have access to cell phone and only 2% of parents do not have access to cell phones. Among them it was found that 100% of the parents responded positively towards the attendance SMS of their ward. 90% of parents responded positively towards the academic performance of their ward sent by SMS. This helps them to know their child's performance instantly while 10% of the parents responded that it is useless unless remedial measures are taken. Among the teachers 97% of them responded positively towards the documentation of academic performance of the students E-LMS. This helps them to know the student's academic performance throughout the year and to take necessary remedial measures by individually concentrating on the particular students. But 3% of them said that unless remedial measures are taken there is no use in documenting the academic performance of the students.

Examination performance of students before and after using e-LMS

Students score in the examination is important criteria for the academic performance. Students who are scoring below average marks is 30% (35% out of 100), average score is 45% (35% – 75% out of 100) and above average is 25% (more than 75% out of 100) before using the e-LMS. The marks of students who are scoring below 35% have come down and the percentage of average scorers also iincreased after using the courseware.

Comparative analysis of absenteeism, average marks, sustainability, overall performance of students before and after implementation of e-LMS

Comparative analysis is carried out to check the impact of the e-LMS among the students, teachers and parents. e-LMS reports / documents and manual records of before implementation of e-LMS (progress report card of students in which the overall performance of a student documented term wise) were analyzed. From the records it was found that the absent rate before implementing the biometric attendance system was 6%. After implementing the biometric system the absent rate has gone down from 6% to 2%. The average marks before implementing the E-LMS was found to be students who were scoring below 35 marks constitute 35% in a class, students who score 35 - 75 marks were 40% and above 75 marks are 25%. After implementing the E-LMS there is a internal shift between this mark based division the percentage of below average students came down from 35% to 25%. And the average scorers range increased since some of the below average students shifted to average levels. The students' sustainability with the learning system was found to be 75% and 25% of the students did not cope-up with the learning systems. After implementing the E-LMS, the non sustainability ratio of the student has come down, since they are forced to follow the learning systems practiced in the school. The overall performance of a student i.e., their academic performance, disciplinary issues, extra-curricular were documented manually in report cards. The average overall performance of a student was found to be 70%. The overall performance of the student after implementing the E-LMS found to be increased because, the performance of the student was documented and reported promptly, than manual system which were reported only thrice a year.

Expert Interview

From the in-depth interview experts given following points, opinions and suggestions: School management needs to have a regular interaction with the parents to have a better understanding. The performance of students should be analyzed on all dimensions. The e-LMS will help the management in making very quick decisions. Reporting systems will be useful when parents never turn up to the schools. The SMS mode of sending test marks to parents makes them aware about the achievement level of their kids. SMS mode easily reaches the parents. Motivating the students will achieve maximum attendance and performance. This prevents absenteeism and droupouts. It leads to more sustainability in the system. Secured feeling among the parents will increase. e-LMS redefined the way the students' performance. Easy for teachers to track down & access the performance of students. SMS is one of the fastest methods of communication and best reporting method. e-LMS brought the schools and parents community closely. Governments and other authorities should encourage the schools in implementing these e-LMS technologies will give a better development for education.

FINDINGS AND CONCLUSION

The effectiveness of e-LMS is excellent among the rural high school students. The absenteeism ratio has declined after integrating the biometric attendance system into learning management system. This in turn reflected in the academic performance of the students since they have no other option than sustaining with the learning process. The success of e-LMS depends upon the remedial measures should be carried out when

needed. The greatest advantage and prime reason for the success of e-LMS is 'instant reporting.' In manual reporting system, the academic performance and overall performance of a student is reported only thrice a year using progress report cards, whereas in e-LMS the overall performance of a student is reported instantly. Since the performance of the students was reported instantly and remedial measures were carried out when needed, the overall performance of students' progress gradually besides improving their academic performance. The success of e-LMS is that it has instant reporting systems integrated into it. To make the e-LMS more effective, the reporting system should be enhanced. Reporting systems in regional languages; Web based reporting system; Two way SMS communication; Touch screen information kiosk integrated with e-LMS for reporting. E-LMS has positive impact among the rural high school students. This will prove very effective when implemented in large scale.

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THE EVALUATION OF ECONOMIC AND SOCIAL FACTORS' INFLUENCE ON THE SCENARIOS OF HIGHER EDUCATION DEVELOPMENT IN RUSSIA

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ABSTRACT

The research is devoted to the analysis of economic and social factors' influence on the long-term development of higher education development in Russia. The method which is used is Analytical hierarchy process. The pilot project enabled 8 experts in higher education in Russia to take part in the research. In the main research project 30 experts from different groups of actors are supposed to take part by giving their preferences to economic and social factors' influence on Higher education development in Russia. The survey is based on research scheme made in advance and consists of two tournaments. After the first tournament by means of a specific computation procedure the scenarios are formulated, which on the second tournament of the survey are going to be estimated by experts. In the end of the research the final scenario is generated and the conclusions, explaining the proposed scenario of the long-term Higher education development in Russia are given.

INTRODUCTION

Today's modern economy is characterized as knowledge-based economy, so the importance of education and its development is now regarded by scientists and researchers from all over the world as themes of big importance.

The problems in Higher education in Russia and their solution were examined by Y.I. Kuzminov «The Higher education for the mass», A.Y. Volkov, Y.I. Kuzminov, I.M. Remorenko, B.L. Rudnik, I.D. Frumin, L.I. Jacobson «Education in Russia in 2020: the education model for the innovation economy», S. Belyakov «The education modernization in Russia: the improvement of management», T.L. Klyachko, V.A. Mau «The tendencies of Higher education development in Russian Federation», A.A. Fursenko «On the notion of Higher Education: 2008-2016», S.M. Guriyev «Our highest education», L.I. Polishchuk, E. Livni «The quality of Higher education in Russia: competition and labor market's roles» and other numerous scientists.

Foreign experts regarded the significance of various inner end external factors' influence on educational system development and the reaction on them from the side of managerial boards. These aspects could be found in such works as, for example: «Board of Regents – University of Wisconsin System», J. Atkinson-Grosjean «The Use of Performance Models in Higher Education: A Comparative International Review», D. Braun «Changing Governance Models in Higher Education: The Case of The New Manageralizm», F.A. van Vaught «Policy Models and Policy Instruments in Higher Education. The Effects of governmental policy-making on innovative behavior of higher education institutions», «Education Governance and Social Integration and Exclusion», R. Birnbaum «Management Fads in Higher Education: Where They Come From, What They Do and Why They Fail», «Governance for Quality of Education».

In other works the system of Higher education is described and possible ways of transformation and withdrawal from the current situation and desirable managerial and educational models are analyzed («Campus-2020-II. Governance», «New Models for Higher Education: Creating an Adult-Centered Institution», C.C. Burton «The Higher Education System. Academic Organization in Cross-National Perspective», «The Changing Landscape of Education Governance», B. Friehs «Models of Education Governance and Administration», «From Goals to Results: Improving Education System Accountability, Challenge to Lead Series», «Reorganization of Education Governance», R. Hahn «The Global State of Higher Education and the Rise of Private Finance», D.E. Hanna «Higher Education in an Era of Digital Competition: Emerging Organizational Models» и т.д.).

The aim of the research is to explore and evaluate the economic and social factors' influence on Higher education development in Russia.

Such researchers as A.V. Sokolov «The long-term Foresight projection of Higher education development», E.P Tavokin «The research of socio-economic and political process» and T. Saati «Decision making. Analytical Hierarchy Process» had suggested and applied different projection methodologies and methods to the long-term projection of Higher education in different countries.

The problem: But while methods based on both mathematical calculations and expert's choice are used worldwide, in Russia there are used either tentative or methods based on statistical data.

The research novelty consists in the application of T. Saati method called «Analytical Hierarchy Process» (AHP), which is based on experts' choice method and mathematical calculation both.

METHODS AND PROCEDURES

One of the approaches, which is based on the T. Saati method and is called AHP helps us to resolve problems of lacking complexity while resolving the problem of educational projection. The strong features of the method consist in the possibility to take into account diverse elements (factors', actors', actors' aims and other), influencing on the system, while making the long-term projection.
As for the sources of information while using AHP - paper analysis, statistical data and expert's knowledge (on the stage of scheme creation and pairwise comparison) - are used.
So AHP allows using not only the information from the paper sources or just experts judgment, but group opinion on the complex questions obtained by means of pairwise comparisons as well.
Talking about AHP we should mention its disadvantages as well. This method can't be used when the problem can't be decomposed and presented in a hierarchy format of smaller parts or in the case of experts' absence.

The stages of research implementation are:

1. On the preliminary stage we had analyzed different paper works and studies of other researchers on the theme and determined a problem on the sphere mentioned above and marked out the T.Saati method.
2. Then, on the first stage with the help of experts and paper analysis I had determined groups of factors and actors influencing Higher education development.
3. The second step was to draw up a scheme, which is presented below.
   The scheme consists of:
   1) Research focus «higher education development during in 2010 - 2020»
   2) The factor's level: factors which will influence on the higher education system in Russia in 2010-2020
   3) The actor's level – level of the main characters, who will influence the factors of higher education development in Russia in 2010-2020.
   4) The level of actors' aims
   5) The level of contrast scenarios.
   What is going to be done next is:
4. The next step is to conduct a survey in two tournaments
   To form the groups of selected experts;
   To make an inquiry form for experts
   To run the first tournament
   To make mathematical calculations and develop second tournament inquiry for based on it.
   To run the second tournament of the survey.
5. On the third stage of the research
   To formulate the scenarios of long-term higher education development in Russia on the basis of the inquiry made;
   To organize the second tour of the inquiry to state the optimal scenario of long-term higher education development in Russia;
   To run a conformity test of expert groups in the field of higher education.
6. To formulate the valid conclusions on the basis of conducted survey.

The pilot project survey's scheme and its results are presented below (Scheme 1).

While working with experts randomization of the questions on the inquiry form with the aim of possible avoidance of the information received should be used.
On the step of data collection experts are asked to give their judjements (by means of pairwise comparison) to the alternatives, placed on each scheme level.
In the inquiry form we use the scale of relative significance.

Table 1

The scale of relative significance

The intensity of relative significance	The definition	The description
1	The equal significance	*An equal* contribution of both categories to the aim
3	Slight dominance	Slight domination of contribution to the aim of one category in the pair above another
5	Essential or strong dominance	*Strong* domination of contribution to the aim of one category in the pair above another
7	Significant dominance	*Very strong* domination of contribution to the aim of one category in the pair above another
9	Superiority of one above another	*Full domination* of contribution to the aim of one category in the pair above another
2,4,6,8	Intermediate significances between categories stated above категориями	Are used in the compromise case [Саати, Кернс, 1991, с. 32]

Scheme 1

The research scheme «Projection of Higher education system development in Russia»

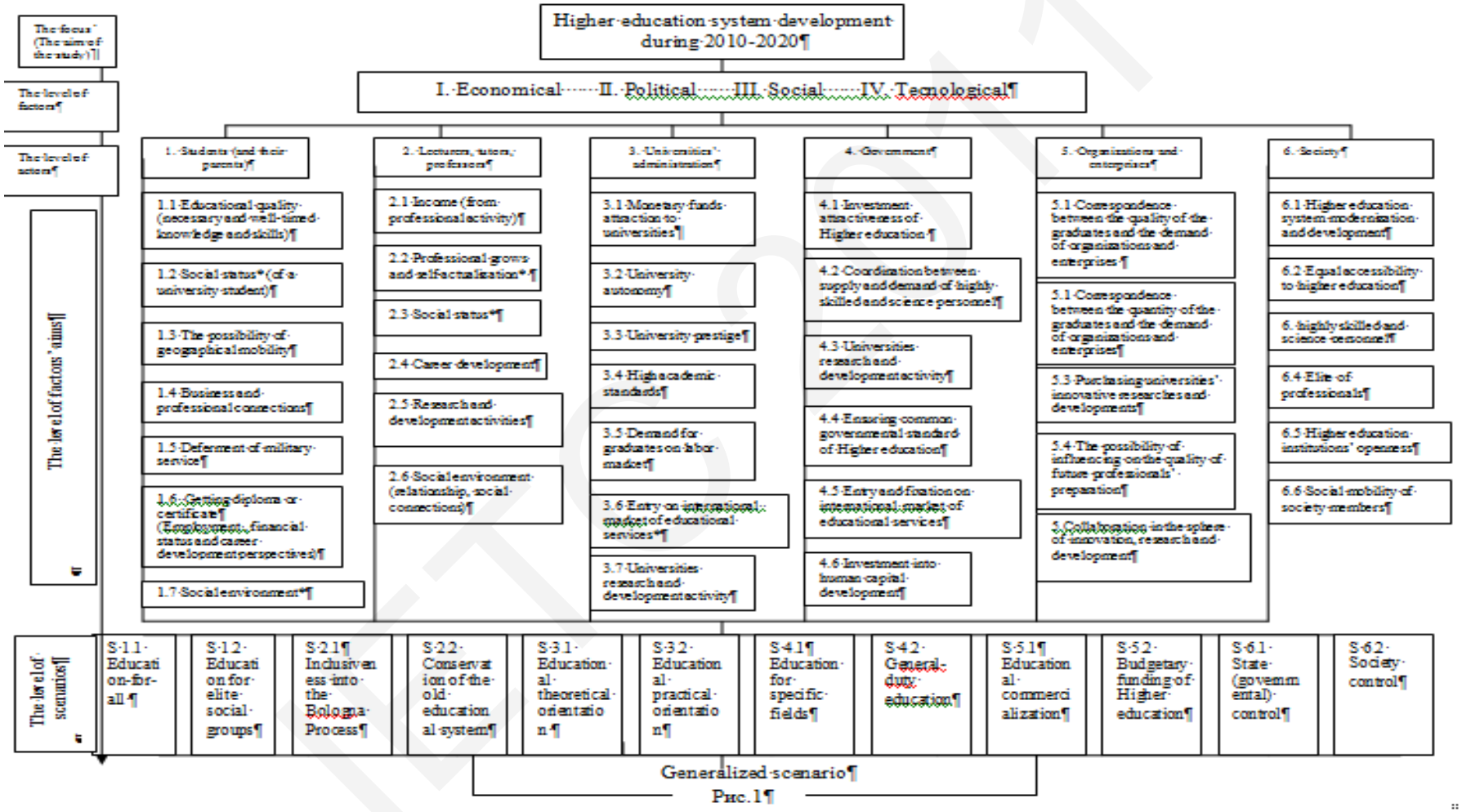

Рис. 1

The next research objective is to aggregate all pairwise comparison matrices received for each expert into matrices for each question, and to check its conformity.
Later weighting coefficient values for each level are calculated. While calculating the coefficients of the level the values of the coefficient of each downstream level of the of the hierarchy are taken into account [Саати, Кернс, 1991; Саати, 1993, Саати, 2008].
On the stage of pilot survey data collection six experts in the field of Higher education took part. They are:

Abankina Irina Vsevolodovna – Candidate of Economics, Director of Institute for Educational Studies;

Abramov Roman Nikolaevich - Candidate of Sociology, associate professor of Social Institutions' Analysis, Sociology of Education lecturer, Higher School of Economics;

Musarsky Mark Mikhailovich – Doctor of Economics, professor of the faculty of Economics of Education, Moscow Institute of the open education;

Solyannikova Svetlana Petrovna - Candidate of Economics, assistant of the director of department for the research; associate professor of Finance Academy under the Government of the Russian Federation;

Stukal Denis Konstantinovich – Applied Politology lecturer, Higher School of Economics;

Chepurenko Alexander Ulyevich – Dean of Faculty of Sociology, Professor Department of Economic Sociology , Senior Research Fellow of Laboratory of Sociological Studies, Higher School of Economics.

It should be pointed out that the conformity relation values for all aggregated matrices of pairwise comparisons belonged to the interval from 0,01% до 5,61%. It indicates quite high conformity of experts' judgments on all sets of questions, as the accepted interval of the coefficient of conformity relation is the interval from 0 % to 10 % [Саати, Кернс, 1991, с.39].

RESULTS

After the analysis of the experts' judgment data, it can be pointed out that the most important on the factors' level are the factor of lecturers' qualification (23,5%), the factor of financing of Higher education system (21,5%), the factor of international integration and cooperation in the sphere (12,4%) and the factor of resource base (12,1%).
On the fifth position, according to experts judgment, is the factor of students' relation to the knowledge and skills obtainment process (11,4%). Then the factor of coordination of supply and demand of highly skilled and science personnel (10, 3%) and the factor of accessibility of Higher education (8,8%) follow.
On the actors' level the most significant influence on factors of Higher education development in Russia during the period of 2010-2020 will have universities administration (23,15%), students (21,03%), Russian Federation Government (20,85%) and university lecturers (14,98%). The least important for the system development actors in the list are organizagions and enterprises (11,26%) and society (8,73%).
While evaluating the importance of actors' aims, we have received that the most important among them are: monetary funds' attraction to the Higher education institutions (15,26%); graduate students' employment perspectives (12,47%) and universities' research and development activity (11,49%). Less weights received such aims as correspondence between supply and demand of graduates of Higher education system (9,97%), Lecturers' income from their professional activity (9,87%), universities' prestige (5,47%), the quality of Higher education (4,8%), professional growth and professional self-actualization of lecturers (4,72% и 3,95%).
The list of aims stated above are the most important, as experts think, from the whole set of aims of all actors of Higher education system. They all weigh 82%.
Afterwards the estimation of the most perspective scenarios of Higher education development in Russia for the most significant actors' aims was made. The results of weighting coefficients, received on these step of expert data analysis are given in Table 2.

Table 2

Generalized scenario of Higher education development in Russia during 2010-2020

	Scenarios of Higher education development in Russia during 2010-2020	Weighting coefficients of scenario preference
Generalized scenario with	Innovative (orientation on modern methods and technologies of teaching)	32,4%

scenarios' preference weights	Practical orientation of education (orientation on practical skills and knowledge)	20,3%
	International integration and cooperation in the sphere	14,8%
	Education for elite social groups (either for talented or for those who is able to pay for their education)	14,5%
	Theoretical and scientific orientation of education	12,2%
	Education for all	5,9%
	The sum:	100%

So, the result of research implementation is presented in generalized scenario of Higher education development in Russia, which can be formulated as ***Innovative Higher education, oriented on practical skills and knowledge, and international integration and cooperation in the sphere for the elite groups of population***.
By elite groups of population we understand either talented or those who are able to pay for their education.

CONCLUSIONS

As a result of the research implementation the conclusion could be made, that among all factors influencing the Higher educational development economical and social factors (the factor of financing of the system of Higher education (21,5%) and the factor of lecturers' qualification (23,5%), play most significant roles).
So, as we had implemented only the pilot project with a small group of experts we are going to continue studying the problem by scheme perfection and attraction of more groups of different experts into our survey. It should be stressed that the creation of hierarchy scheme itself is the most important part of the research. Afterwards experts give their judgments to the pairs of alternatives included into the scheme and as a result the long-term projection based on experts' knowledge could be received.
One of the most important things while working on the scheme is the necessity of including all significant alternatives on each level. On this stage experts, who can complement or criticize the research model, could be attracted.
We also should keep in mind the possibility of different ways of interpreting of the alternatives included into the research scheme by the experts. That is why the thesaurus with the alternatives' description should be made for experts, which than should be used distributed among experts on data collection stage.
The conformity of experts' opinions is one more significant issue. Coefficient of conformity relation is the instrument, which sould be used to check it.
In the end, we should point out that application of such complex method as AHP, is not only possible while determining different factors influence on such a complex system as Higher education system, but is also applicable for the next stage – planning of the development of the system.

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THE EXAMINATION OF ONLINE SELF-REGULATED LEARNING SKILLS IN WEB-BASED LEARNING ENVIRONMENTS IN TERMS OF DIFFERENT VARIABLES

WEB TABANLI ÖĞRENME ORTAMLARINDA ÇEVRIMIÇI ÖZ-DÜZENLEYICI ÖĞRENME BECERILERININ FARKLI DEĞIŞKENLER AÇISINDAN İNCELENMESI

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Özet
Bu araştırmanın amacı web tabanlı öğrenme ortamlarında çevrimiçi öz-düzenleyici öğrenme becerilerinin öğrencilerin bilgisayar, internet ve web tabanlı öğretime yönelik tutumlarını farklılaştırıp farklılaştırmadığını belirlemektir. Araştırma betimsel bir niteliktedir. Tarama modelinde yürütülmüştür. Araştırmanın çalışma grubunu 169 üniversite öğrenci oluşturmaktadır. Bu araştırmanın verileri Çevrimiçi Öz-Düzenleyici Öğrenme Ölçeği (α=0,94), İnternete Yönelik Tutum Ölçeği (α=0,77), Web Tabanlı Öğrenme Tutum Ölçeği (α=0,86) ve Bilgisayar Tutum Ölçeği (α=0,97) kullanılarak toplanmıştır. Toplanan veriler üzerinde frekans, yüzde, aritmetik ortalama, t ve Pearson's r korelasyon istatistikleri kullanılıştır. Elde edilen sonuçlardan bazıları şunlardır: Çevrimiçi öz-düzenleme becerileri düzeyleri öğrencilerin internete dönük tutumlarını etkilemektedir. Çevrimiçi öz-düzenleyici öğrenme beceri düzeyleri, "Web Tabanlı Öğretimin Etkililiği" faktörü açısından öğrencilerin web tabanlı eğitime dönük tutumlarını farklılaştırmaktadır. Çevrimiçi öz-düzenleyici öğrenme beceri düzeyleri, öğrencilerin bilgisayara dönük tutumlarını farklılaştırmaktadır.

Anahtar Kelimeler: Web tabanlı öğrenme, öz-düzenleyici öğrenme, bilgisayar, internet, tutum

INTRODUCTION

It can be argued that rapidly starting to use information and communication technologies in education, as it brings along different concepts, brings about people to need more skills day in day out to be able to keep up with developing technology and in this case, computer use leads to an inevitable necessity in terms of both individual and social rationales. Besides, computer motivating students more, supporting life-long learning and increasing flexibility in education programs can be said as principle reasons of computer usage (Keser, 1988; Alkan, 1997). On the other hand, today, learning is regarded as a concept that can emerge not only in schools and specific centers but also in all kind of environments and every phase of life (Reigeluth, 1999).

There may be plenty of conditions for web-based education to be able to become successful. One of them is self-regulated learning skills. Self-regulated learning, which refers to an active and constructive process when individuals attempt to adjust their behaviors, supra-cognitive competency and motivation towards learning goals they introduce, limit their goals by guiding with respect to environmental influences, can be said to possess an important function in developing life-long learning skills (Pintrich, 2000; Zimmerman, 2002; Wirth & Leutner, 2008). Many researchers conducted on self-regulated learning put forward that there is a positive significant relationship between students' motivation levels and learning strategies that they use and academic accomplishments (Pintrich & De Groot, 1990; Zimmerman & Martinez-Ponz, 1990). These findings led to the concept of self-regulation to be on the rise and politicians, who guides education in distinct countries, and educational psychologists to regard self-regulation as a key to success (Boekaerts, 1999).

In terms of web-based education to be able to provide sufficient contribution to academic accomplishment, in addition to self-regulated skills, it can be said that students' attitudes directed to web-based education, computer and internet are important. Attitude is defined as "considerably organized long-term sensation, faith and behavior tendency" (Cuceloglu, 1998). Khine (2001) describes attitude as a mental preparation condition that affects people's stances against a situation and formed as a result of their lives. Ozgur and Tosun (2010) denote that attitudes directly affect success in web-based education and it is quite important to appropriately meet student expectations and requirements in time in terms of their accomplishments.

The objective of this research is to determine whether online self-regulated learning skills differentiate students' attitudes towards computer, internet and web-based education. In this context, questions below were sought an answer:

1. How are the self-regulated learning skill levels of students in online environments?
2. Is there a correlation between students' online self-regulated learning skills and attitudes toward internet?
3. Is there a correlation between students' online self-regulated learning skills and attitudes toward web-based education?

METHOD

Research is of a descriptive character. It was conducted in the scanning model. 169 students(female 111, male 58) in total in five departments receiving the course of Computer II in the form of web-based instruction practice in the Departments of Elementary Education Science and Social Studies Teaching in the Faculty of Education of Ahi Evran University during 2010-2011 spring semester constitute the study group of this research.

The data of this research were gathered using Online Self-Regulated Learning Scale, Attitudes toward Internet Scale, Web-Based Learning Attitude Scale and Computer Attitude Scale. The details concerning scales are as follows:

Self-regulated learning skills of students in online environments were collected by using Online Self-Regulated Learning Scale designed by Bernard et al. (2009) and whose original name is "Online Self-Regulated Learning Questionnaire (OSLQ)". The scale developed by Bernard et al. (2009) consists of six factors and 24 items in total. The validity and reliability study of the scale was performed separately in two distinct study groups as consisting of students, who received education in both blended learning and online learning environments. Confirmatory factor analysis was carried out to determine structure validity in both applications. Parameters in both applications point to its acceptable fit for this structure with 6 factors. Turkish adaptation of the scale was made by Korkmaz and Kaya (on press). Researchers employed confirmatory factor analysis to test structure validity of the scale in Turkish culture. On the other hand, Cranach's alpha values regarding factors are seen to vary between 0.632 and 0.941.

"Attitudes toward Internet Scale", whose reliability and validity studies were performed developed by Tavsancil and Keser (2001), was employed to measure student attitudes toward internet. The scale, which is 5-point Likert scale, consists of 25 items and 5 factors. Five factors explain 55.381% of total variance. According to analyses conducted by Tavsancil and Keser (2001), the internal consistency coefficient for the whole scale was estimated as 0.79.

"Web-Based Learning Attitude Scale", whose reliability and validity studies were performed developed by Erdogan, Bayram and Deniz (2007), was employed to measure student attitudes toward web-based education in this research. The scale, which is 5-point Likert scale, consists of 26 items and 2 factors. These two factors explain 47.308% of total variance. According to factor analysis conducted by Erdogan, Bayram and Deniz (2007), the internal consistency coefficient for the whole scale was calculated as 0.861.

"Computer Attitude Scale", which was developed by Janes and Clarke (1994) and adapted into Turkish by Uzunboylu (1995), was used to measure student attitudes toward computer. The scale, which is 5-point Likert-type, consists of 40 items and it is single dimensional. The internal consistency coefficient of the scale was calculated as 0.97. Positive items in the scale were graded from 5 to 1 and negative items were inversely graded from 1 to 5 in options of "I Totally Agree – I Certainly Do Not Agree".

To be able to mention online self-regulated learning skills of students and their attitudes towards web-based education, of course, they should experience web-based learning. In this context, 6-week portion of the course of Computer II was applied in the form of web-based instruction. Instruction practice incorporates the subjects of basic concepts regarding internet-based education, internet-based education in Turkey and the world, content design in internet-based education and learning and motivation. 3-week part of web-supported instruction practices lasting 6 weeks was performed in the normal hour of the course in the program; in the rest 3-week part, students were provided flexibility to resume their practices in anywhere. Computer laboratories were kept open in hours with no course under the supervision of department assistants for students to be able to easily access computer and internet. Student-student, student-instructor and student-content interaction were provided for students as both senkron and asenkron. Student questions related to content were provided senkron or asenkron feedback and correction within the context of chat and forum. Face-to-face interaction with students was abstained

in the part of practice within the course, it was elaborated that all interaction was realized in chat platform. Asenkron feedback was provided by using forum platform in the part of practice outside the course.

A web site was prepared incorporating the subject of the basic concepts regarding internet-based education, internet-based education in Turkey and the world, content design in internet-based education and learning and motivation in accordance with web-based learning approach within the scope of research. In prepared web site, explanations of topics were supported by various videos. Dreamweaver software was used for visual design of the site, Articulate software was used for content design and Ms-Sql and PHP softwares were employed for student management system. A student management system, where informations such as study durations of students, what topics are studied, answers given to exercises etc. are kept, is situated on the designed web site. Students can access topics via their own passwords. Necessary interventions were carried out aimed at ensuring students to use the system in accordance with records in student management system.

Each item on scales was scaled as never (1), rarely (2), sometimes (3), usually (4), always (5). Converting the scores that students obtained for answers they gave to 5-point Likert type scale into standard scores in a way that the lowest one will be 20 and the highest will be 100 is appropriate. When students are grouped with respect to online self-regulated learning skill levels, students with the average score being 66 and below were designated as sub-group and students with the average score being 67 and above were designated as upper-group. Frequency, percentage, arithmetic average, t and Pearson's r correlation statistics were used on the collected data. Significance level of 0.05 was predicated on for testing of difference and correlations.

RESULTS

1. Self-Regulated Learning Skill Levels in Online Environments:

Online self-regulated learning levels of students, who participated in web-based learning practices, are summarized on Table 2.

Table 2. Online Self-Regulated Learning Levels of Students

Variables	N	$\bar{X}$	sd	Min	Max
Goal Setting	169	70,65	14,22	32,00	100,00
Structuring the Environment		77,57	17,21	20,00	100,00
Task Strategies		65,98	13,19	30,00	95,00
Time Management		65,16	13,12	20,00	100,00
Help Seeking		71,63	14,30	25,00	100,00
Self-Regulation		71,41	14,23	30,00	100,00
Total		**70,56**	**11,19**	**35,00**	**95,00**

As seen on table 2, online self-regulated learning skill scores of students vary between 35.00 and 95.00; their average is $\bar{X}$=70.56. Accordingly, it can be argued that self-regulated learning skills of students in online environments are high. When looking at in terms of scores regarding factors one by one, it is seen that the factor with the highest average is "Organizing Environment" ($\bar{X}$=77.57) and the factor with the lowest average is "Time Management" ($\bar{X}$=65.16). So, it can be uttered that the highest level student skills in terms of their online self-regulated learning levels is "Organizing Environment" and the lowest level is "Time Management".

2. The Relationship between Their Online Self-Regulated Learning Skills and Attitudes towards Internet

Online self-regulated learning skills of students were allotted into two groups as sub-level and upper-level. Students with the total score of online self regulated learning skills being 66 and below comprised sub-group and students with the total score of online self regulated learning skills being 67 and above constituted upper-group. Findings related to the relationship between online self-regulated learning skills and attitudes towards internet are summarized on Table 3.

Table 3. The Relationship between Online Self-Regulated Learning Skills and Attitudes towards Internet

	Goal Setting	Structuring the Environment	Task Strategies	Time Management	Help Seeking	Self-Regulation	**Total**
Internet Denial	,240(**)	,237(**)	,071	,153(*)	,179(*)	,214(**)	,246(**)
Internet Trust	,079	,124	-,021	-,011	,017	,136	,081
Belief in Internet's Benefits	,100	,133	-,064	-,013	,050	,102	,080
Enjoying Internet	,117	,111	,004	,027	,112	,120	,113
Enjoying Internet's benefits	,095	,136	,002	,157(*)	,134	,271(**)	,173(*)
Total	,195(*)	,216(**)	,017	,097	,149	,226(**)	,207(**)

N:169; ** p< 0.01; * p<0.05.

It is observed in Table 3 that there is a positive and significant relationship (r=207) between the total score of online self-regulated learning skill and the total score of attitude towards internet. Besides, there is a positive and significant relationship between the total score of attitude towards internet and "Goal Setting", "Organizing Environment" and "Self-Evaluation"; between the total score of online self-regulated learning and the factor of "Denying Internet". Accordingly, it can be said that as positive attitudes of students towards internet increase, their online self-regulated learning skill levels also increase. Besides, as their attitudes toward internet increase, their skill levels of "Goal Setting", "Organizing Environment" and "Self-Evaluation" accordingly go up; as "Denying Internet" increases, their total scores of online self-regulated learning accordingly go up.

Considering in terms of factors, there is a significant positive relationship between total scores for online self-regulated skills and "Enjoying Possibilities that Internet Offers" and "Time Management", "Self-Evaluation" among other skills except the factor of "Denying Internet" and "Duty Strategies" among self-regulated learning skills. Accordingly, it can be argued that as student levels for getting accustomed to internet go up, their skill levels of "Goal Setting", "Organizing Environment", "Time Management", "Seeking Help" and "Self-Evaluation" also increase. On the other hand, it can be said that as their attitudes of "Enjoying Possibilities that Internet Offers" increase, their "Time Management" and "Self-Evaluation" skill levels also go up. Findings related to differentiation in student attitudes towards internet with respect to their online self-regulated learning skills are summarized on Table 4.

Table 4. Differentiation among Student Attitudes towards Internet with respect to Their Online Self-Regulated Learning Skill Levels

Variables		N	$\bar{X}$	sd	t	df	p
Internet Denial (reverse coded)	Subgroup	53	77,89	13,27	-2,557	167	,011
	Topgroup	116	83,29	12,51			
Internet Trust	Subgroup	53	75,28	18,15	-1,026	167	,306
	Topgroup	116	78,10	15,82			
Belief in Internet's Benefits	Subgroup	53	77,83	15,86	-,679	167	,498
	Topgroup	116	79,57	15,25			
Enjoying Internet	Subgroup	53	78,49	14,79	-1,414	167	,159
	Topgroup	116	83,49	23,71			
Enjoying Internet's benefits	Subgroup	53	73,36	16,74	-1,952	167	,046
	Topgroup	116	78,26	15,60			
Total	Subgroup	53	76,96	11,57	-2,228	167	,027
	Topgroup	116	81,28	11,73			

As seen in table 4, there is a significant differentiation among student total scores for attitude towards internet according to their online self-regulated learning skill levels ($t_{(2-167)}$ =-2,228; p<,05). When looking at attitude toward internet in terms of factors, it is seen that there is a significant differentiation between factors of "Denying Internet" ($t_{(2-167)}$=-2,557; p<,05) and "Enjoying Possibilities that Internet Offers" ($t_{(2-167)}$=-1,952; p<,05), as for other factors, there is not a significant differentiation with respect to online self-regulated learning skills. When averages examined, it is seen that differentiation is in favor of upper group. Accordingly, it can be asserted that the total score of online self-regulated learning skill levels differentiate student attitudes towards internet in terms of factors of "Denying Internet" and "Enjoying Possibilities that Internet Offers". In other words, online self-regulated skills affect student attitudes towards internet.

3. The Relationship between Online Self-Regulated Learning Skills and Attitudes towards Web-Based Education

Findings pertaining to the relationship between online self-regulated learning skills and attitudes toward web-based learning are summarized on Table 5.

Table 5. The Relationship between Online Self-Regulated Learning Skills and Attitudes towards Web-Based Education

	Goal Setting	Structuring the Environment	Task Strategies	Time Management	Help Seeking	Self-Regulation	**Total**
Effectivity of WEB Based Teaching	,082	,140	,064	,105	,229(**)	,148	,169(*)
Resistance against Web Based Teaching	,223(**)	,207(**)	,303(**)	,181(*)	,204(**)	,163(*)	,274(**)
Total	,046	,015	,098	,003	,092	,045	,005

N:169; ** p< 0.01; * p<0.05.

It is seen in table 5 that there is no relationship between the total score for online self-regulated learning skill and total scores for attitude towards web-based learning. So, it can be argued that an increase or a decrease in total scores of student attitudes towards web-based learning do not affect total scores for online self-regulated learning skill. Considering in terms of factors, it is observed that there is a significant positive relationship between the factor of "The Efficacy of Web-Based Instruction" and

"Seeking Help" and total scores for online self-regulated learning skill. Additionally, it is seen that there is a significant positive relationship between all factors and total scores concerning online self-regulation skills and the factor of "Resistance Against Web-Based Education". Accordingly, it can be uttered that as attitudes towards the factor of "The Efficacy of Web-Based Instruction" rise, all factors and total scores of students regarding "Seeking Help" and total scores of online self-regulated learning skills also go up accordingly. Besides, it can be said that as their attitudes for "Resistance Against Web-Based Education" rise, all factors and total scores of students regarding online self-regulation skills also increase accordingly. Findings related to differentiation in student attitudes towards web-based learning with respect to their online self-regulated learning skills are summarized on Table 6.

Table 6. Differentiation among Student Attitudes towards Web-Based Instruction with respect to Their Online Self-Regulated Learning Skill Levels

Variables		N	$\bar{X}$	Sd	t	df	p
Effectivity of WEB Based Teaching	Subgroup	53	67,94	13,65	-2,762	167	,006
	Topgroup	116	74,04	13,17			
Resistance against Web Based Teaching	Subgroup	53	66,70	14,35	1,879	167	,062
	Topgroup	116	61,89	15,91			
Total	Subgroup	53	67,53	10,74	-1,378	167	,170
	Topgroup	116	69,84	9,86			

As seen in table 6, there is a differentiation only in terms of the factor of "The Efficacy of Web-Based Instruction" in student attitudes towards web-based learning with regard to online self-regulated learning skill levels of students ($t_{(2-167)}$=-2,762; p<,05). When averages examined, it is seen that this differentiation is in favor of upper group. It is observed that there is no significant differentiation between groups in terms of total score and the factor of "Resistance Against Web-Based Education". Accordingly, online self-regulated learning skill levels can be said to differentiate student attitudes towards web-based education in terms of the factor of "The Efficacy of Web-Based Instruction".

DISCUSSION AND CONCLUSION

Self-regulated learning skill levels of students in online environments are high. While the highest level skills of students are "Organizing Environment" in terms of their online self-regulated learning levels, their lowest skills are "Time Management". Even though online learning environments are popular today, students receiving education in the faculty where this research was conducted generally have gotten to know online learning environments recently. High scores of students in the sub-factor of "organizing environment" should not be perceived as contradictory with this situation. Because, student is unfamiliar to online learning environment, not online environment. Put it differently, online experiences that students attained before assisted them while organizing online learning environment during the learning process realized throughout research. On the other hand, their low scores in the sub-factor of "time management" is a situation frequently emphasized in the field literature. Howland and Moore (2002) stated the difficulty for students to follow a specific work schedule in learning environment and organizing time is a critical requirement.

Online self-regulated learning skill levels differentiate student attitudes toward web-based education in terms of the factor of "the Efficacy of Web-Based Instruction". An increase or a decrease in total scores of student attitudes towards web-based learning does not affect total scores of online self-regulated learning skills. Nevertheless, as their attitudes regarding the factor of "the Efficacy of Web-Based Instruction" rise, total scores of online self-regulated learning skills of students and "Seeking Help" rise accordingly. Furthermore, as their attitudes of "Resistance against Web-Based Education" go up, all factors and total scores concerning online self-regulation skills of students rise accordingly.

As a conclusion, further research is needed aimed at how their online self-regulated learning skills affect attitudes of students directed to computer, internet and web-based education and additionally, how these variables affect academic success. Educational institutions, instructors and educational designers obtaining more pre-information about perception, motivation and attitudes of students before performing a course will serve them to increase interaction diversity in online environments, to better understand problems that students might face and as a result, to effectively fulfill educational goals of students.

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THE FACTORS THAT MOTIVATE AND HINDER THE STUDENTS WITH HEARING IMPAIRMENT TO USE MOBILE TECHNOLOGY[1]

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ABSTRACT: This research which aims to find out the factors that motivate students with hearing impairment to use PDA (Personal Digital Assistant), a product of mobile technology, in instructional activities, interactions with their peers and instructors, and in their daily lives, and the factors that hinder these individuals from using PDA was designed as an action research. The research was conducted with 12 students with hearing impairment taking "BIL151Fundamentals of Information Technology-I" course in School for the Handicapped, Department of Applied Fine Arts at Anadolu University. The participants used the HP IPAO hw6915 modeled PDAs for education and social interaction purposes in the activities carried out in the scope of the research for 16 weeks. For data collection, reflections gathered with questionnaire and critic event method were employed. The quantitative data were analyzed with descriptive statistics while the qualitative data obtained from one sample t-test were analyzed with content analysis done in an inductive approach. The research was supported by TUBITAK, The Scientific and Technological Research Council of Turkey (Project Number: 107K022). This article presents the findings of the project that show the situations that motivate and hinder students with hearing impairment to use PDA.
Keywords: Mobile technologies, hearing impaired, motivators, barriers

INTRODUCTION

Children with prenatal or pre-language hearing loss face great difficulties in acquiring the speaking dimension of their mother tongue. The problems in their hearing and the differences in their speech cause the children with hearing impairment not to understand talks thoroughly, reduce intelligibility of their speech, or make them totally unintelligible (Brannon, 1986; Northern and Downs 199; Osberger and Macgarr, 1982; Tüfekçioğlu, 1989). The inadequacy of the speech intelligibility in children with hearing impairment may make their communication through speech harder, and it may even cause them not to communicate at all (Kretschmer and Kretschmer, 1978; Sanders, 1971). These communication breaks of the child with hearing impairment may result in facing problems in social and emotional problems as well as problems in their future lives, education, and work (Sanders, 1971; Tüfekçioğlu, 1992).

Besides face to face communication we experience through talking in our daily lives, we can feel the need to reach previous or distance information, and communicate with the people far away from us. We can use tools such as telephone, fax and e-mail to meet our distance communication need. The widespread use of cell phones and their texting facility began to be an alternative way of communication for individuals with hearing impairment. However, the importance of reading and writing, another dimension of oral communication is undeniable for the individuals with hearing impairment to use distance communication tools. In this sense, mobile technology environments that offer opportunities of teaching and learning free from time and place serve as a very effective option for the education of children with hearing impairment.

The mobile technology concept is generally used to refer to mobile information-communication tools and standards such as cell phones and PDAs (Personal Digital Assistant) (Çuhadar and Odabaşı, 2004). The small size properties of the mobile technologies enable the individuals to carry those tools while they are maintaining their daily life activities. Similarly, a new concept called "m-learning", namely, mobile e-learning appeared in literature with instructional use of these tools which are easy to carry in daily life activities, and suitable for wireless communication.

[1] This study is a part of TUBITAK Project (Project No: 107K022) entitled "Mobile Technologies in the Education of Hearing Impaired Individuals [İşitme Engelli Bireylerin Eğitiminde Mobil Teknolojiler (İBEM)].

There are various definitions of the m-learning in the literature. For instance, while Quinn (2000) defined it as an e-learning activity that can be facilitated through portable computers, Fagerberg, Rekkaedal and Russell (2002) defined it as the use of mobile technologies in the world of education. Similarly, Georgiev, Georgieva and Smrikarov (2004) defined m-learning as the new form of existing e-learning and distant learning applications. The common point of these definitions is originated from the fact that the content of learning is transmitted to the learners through wireless networks by means of mobile instruments (Odabaşı et.al. 2009).

Learners can interact with their peers either on the course related or on extracurricular subjects without any time and place limitations in student center m-learning applications where PDAs are used. One of the important contributions of PDAs, which are used for the purpose of education, is that, they could prolong the teacher-student or student-student discussions that occur during the class hours to the post lesson sessions through using various Internet tools such as blogs, discussion forums or chat rooms. The PDAs could be used at any time by the teachers for feedback purposes, since they provide communication without any time and place limitations and include various communication means such as e-mail, voice call, and SMS (short message), etc. Similarly, PDAs also enable students to ask questions to their teachers or friends and get answers to their questions whenever and wherever they want. Furthermore, since PDAs have Internet access in and out off the school contexts, they could also enable the use of Web-based applications in the courses. The interactive Web pages, which are also called blogs, can be used to provide social interaction among the students and to provide learners a richer interaction environment with other stakeholders. Recent educational studies and theories that focus on blogs highlight the importance of social interaction in the field of teaching and learning (Ferdig and Trammell, 2004).

Although PDAs are assumed as tools that can fill an important gap in education and social interaction areas of both hearing and hearing impaired students, this function of technology can only be fulfilled when individuals with hearing impairment accept and use mobile technologies. It is supposed that recognition of the possible factors that can motivate or hinder individuals with hearing impairment to use mobile technologies for instructional and social interaction purposes, or organizing the learning environments so as to solve the possible problems, might lead acceptance of the technology and motivation for their use by the hearing impaired individuals.

Purpose of the Study

The purpose of the present study is to define the possible factors that can motivate or hinder individuals with hearing impairment to use mobile technologies for instructional and social interaction purposes. The present study employed PDAs as the mobile technology. It is hoped that the findings of the present study might contribute to the further studies in the field and guide the researchers who might design mobile technology based learning environments for the individuals with hearing impairment. Along with this purpose, the present study posed following research questions;

1. What are the motivational factors that might lead to use mobile technologies by the hearing impairment students in their instructional activities, interactions with their peers and instructors, and in their daily lives?
2. What are the hindering factors that might prevent the use of mobile technologies by the hearing impairment students in their instructional activities, interactions with their peers and instructors, and in their daily lives?

Limitations of the Study

- In terms of the content, the present study is limited to the course materials and face to face and online activities that were structured along with these course materials throughout 16 weeks.
- In terms of the mobile technology, the present study is limited to the hardware and software characteristics of a PDA which is commercially known as HP iPAQ hw6915.
- In terms of the online activities that were offered to the students, the present study is limited to a blog environment which was supported by WordPress software.

METHODOLOGY

Research Design

The study was designed as an action research which is one of the qualitative research methods. Action research is a pre-planned and well-organized research process, which intends to improve or understand

the current actions or teaching procedures that exist in real classroom environment and inform other parties about the current phenomenon (Johnson, 2002). The nature of such kind of research designs necessitates figuring out a problem that exist during the practice process and providing solution to that problem through gathering and analyzing the data systematically (Yıldırım and Şimşek, 2005).

Participants

The students with hearing impairment at tertiary level form the universe of the study. When determining the participants in the research, criterion sampling which is the way of examining the cases meeting a series of predetermined criteria (Patton, 2002) was used among the purposeful sampling methods. The criterion used in determining the participants was choosing the students with hearing impairment at tertiary level who hold preliminary information and skills for computer use. Thus, the participants of the study were 12 students with hearing impairment taking "BIL151 Fundamentals of Information Technology-I" course in the Research Institute for the Handicapped Students at the Department of Applied Fine Arts at Anadolu University. The students' participation to the study was on volunteer basis. Additionally, all of the participants signed a written confirmation (consent form) about their volunteer participation to the project prior to the beginning of the research.

Data Collection Instruments

The action research process requires collecting research data systematically in order to identify and solve potential problems that might occur in the teaching environments. It is expected that the collected data should describe the setting (context) sufficiently and in detail. Thus, the data of the study was collected through a questionnaire (survey) and reflections which were performed as critical event analysis technique. The data gathering instruments of the study were explained in detail in the following sections of the paper.

PDA Use Questionnaire

The "PDA Use Questionnaire" is developed and used in the present study in order to identify the possible factors that can motivate or hinder participants to use PDAs. Basically, the questionnaire consists of two separate sections. The questions in the first section inquire the demographic information about the participants, whereas, the second section includes items related to the possible factors that can motivate or hinder participants' use of PDAs for their instructional and social interaction purposes. The second section of the questionnaire includes total 48 items and participants responded each of the items through selecting one of the stated options which are "agree", "neutral" and "disagree".

Regarding the fact that different PDAs have different hardware and software features, 37 of the items in the second section were formed on the basis of the technical features of HP IPAQ 6915 which was the model of PDA used by the participants throughout the research process. Thus, participants stated their opinions through selecting one of the options ranged from "agree", "neutral" to "disagree" in order to identify the factors that can motivate or hinder participants' use of PDAs for their instructional purposes.

The (Practice of) Critical Event Approach

In the last week of the study, participants were asked to write reflection reports and describe the favorable and unfavorable moments that they have experienced while they work with PDAs. The questions were delivered to the participants as two separate forms where they could write their opinions. At the beginning of the practice (study), each of the participants was delivered the first form in which they were asked to write their opinions related to their favorable moments while using the PDAs. The participants were given a plenty of time to write their opinions on the forms. During this process, when the participants gave their forms to the instructor, he examined the forms and guided the participants to write their feelings in detail. However, the instructor paid attention while guiding them so as to not have any effect on the opinions of the participants. Subsequent to students' returning the first forms, they were given the second form in which they were asked to write their opinions related to their unfavorable moments while using the PDAs, and the similar procedures were followed in this phase as well.

The Data Analysis

The descriptive statistical analysis methods were used in the analysis of the quantitative data that obtained by means of questionnaire and percentages, frequencies, means and standard deviation values were identified. Since every parametric tests require the normal distribution of the data (Pallant, 2001), prior to

making any parametric test, all of the data were examined by using SPSS 15.0 software regarding the normality of the distribution of the data, thus, Q-Q, P-P diagrams and histograms were analyzed, skewness and kurtosis values were examined, and Shapiro-Wilk and Kolmogorov-Smirnov (k-s) tests were used in this process. Additionally, one sample t-test was used in order to examine the difference between the mean score that obtained from qestionnaire and the hypothetical mean score.

The expert opinion was also taken in order to establish the reliability of the quantitative data that obtained by means of questionnaires. In terms of the reliability issues, Cronbach alpha internal consistency coefficient was used and 0.70 internal consistency coefficient value was regarded as the baseline (Huck, 2000; Pallant, 2001). As the result of the reliability estimations, the reliability of the first section was calculated as (cronbach alpha) $\alpha = .86$, whereas, it was calculated as $\alpha = .84$ or the second section of the questionnaire.

Inductive content analysis was performed with the qualitative data, which obtained by means of the written responses of the participants on the first form that inquires their opinions related to their favorable feelings while using the PDA, and on the second form that inquires their opinions related to their unfavorable feelings while using the PDA. The main aim of the content analysis is to figure out the findings of the study out of the frequent, dominant and/or meaningful themes that emerged from the raw data (Thomas, 2003). Inductive content analysis requires in-depth analysis of the data, which helps to figure out the themes and dimensions that were not predicted beforehand (Patton, 2002; Strauss and Corbin, 1990).

The reliability and validity calculations of the obtained themes were performed by the field experts and the reliability of the data that obtained by critical event analysis of the first form was computed as .94, whereas, it was computed as .95 for the data that obtained from the themes in the second form. In order to establish the trustworthiness, transferability, credibility and confirmability (Guba, 1981: cited in Shenton, 2004) of the qualitative data, following actions were performed; selecting purposeful sampling, recording and reporting every details througout the research process, objectivity in the identification and interpretation of the data, colecting suficient data, using real data sources, prolonged interaction, perspective based data colection, data triangulation, getting expert opinion and descriptive narration.

RESULTS

The findings related to motivating and hindering factors that affect the use of PDAs by hearing impaired individuals were presented in the following section along with the research questions. The findings of the quantitative data, which were obtained by means of participants' responses to 48 items in the first part of the questionnaire, concerning the opinions of the participants related to the motivating and hindering factors that affect the use of PDAs by hearing impaired individuals, can be summarized as follows;

As the first step, the participants' total scores that they have attained from the first part of the "The Use of PDA questionnaire" were computed. In order to test whether the data match the requirement of normal distribution, which is the prerequisite of the parametric tests (Pallant, 2001), the total scores of the participants were examined by means of Shapiro-Wilk and Kolmogorov-Smirnov (k-s) tests through using SPSS 15.0 software. The test statistics for K-S test was computed as $D=.129$, and in the .05 significance level, the findings were regarded as significant $p>0.05$. The Shapiro-Wilk statistics of the data was computed as $W=.94$ and in the .05 significance level, the findings were regarded as significant $p>0.05$. Additionally, the Q-Q and P-P diagrams were examined. It was observed that the computed skewness value of the distribution (.021) and kurtosis value (-1, 20) were within the normal distribution criteria. Thus, the distribution of the data was regarded as normal distribution.

The mean score of the first part of the "Use of PDA" questionnaire was computed as 18, 25. There are 48 items in this part of the questionnaire. Thus, the minimum mean score that can be obtained from the questionnaire is 48 whereas the maximum score is 114. The hypothetical mean score that can be obtained from the questionnaire is 96. According to the results of one-sample t-test, which was performed to examine the difference between the mean score and hypothetical mean score, the mean score of the items in the questionnaire was found statistically significant at .05 significance level ($t=5.66$; $p<.05$), thus, having higher mean score (118, 25) than the hypothetical mean score (96), revealed that the motivation levels of the participants in using PDAs in their instructional activities is also high. When the mean

scores of each participant were examined further, it was found that none of the participants get lower mean score than the hypothetical mean score. Thus, it can be claimed that all of the participants have higher motivation in using PDAs in their instructional activities.

According to the average points of each item of the questionnaire, "using PDAs in instructional activities" is the most important factor that motivates students to use PDA. Using PDA for interacting with each other follows this. While using PDAs to interact with their instructors is in the third rank, using PDAs in their daily lives is the least motivating factor. When we look at the total average point of each dimension, we see that the most important factor that motives participants to use PDA is "interaction". The third important factor is using PDAs in instructional activities whereas the last factor is using PDAs in daily lives.

When the findings of the quantitative data were reviewed in general, it was found that following courses that the participants missed, reaching the information they look for any time and any place they want, learning information they do not know or missed from their peers, getting immediate response to the messages they send, benefiting from their friends in solving problems related to the course and carrying the course notes with them all the time are the most motivating factors to use PDA. Learning more effectively in the discussions they hold on the net, expressing themselves better in these discussions, and reinforcing what they have learned during the lesson via reaching the main resource and materials of the course through web are among the factors that motivate participants to use PDA.

On the other hand, when the hindering factors that did not lead the participants to use PDAs in their instructional activities were examined, it was found that only five of the items have mean scores below 2.00; thus, it was supposed that those five items might be the factors which prevent participants' use of PDAs in their instructional activities. Not making new friends through PDA, having extra load because of this PDA aided course, feeling obliged to using PDA for lessons all the time, feeling uncomfortable since other people get interested in them while using PDA, and the difficulties they experience in sending messages are the factors that hinder the participants from using PDA.

In terms of equipment properties of PDA, all the participants have high level of motivation to use PDA. The most important equipment factors that motivate participants to use PDA are camera feature of PDAs, having some features not included in cell phones, and using Window operating system which the participants are accustomed to from their computers. Carrying files and data with PDA, keyboard feature, its use as cell phone, running MSN Messenger program, sending e-mails, having calculator and taking notes easily on it are the other motivating factors. The factors that hinder participants from using PDA are using some programs in PDAs only with writing pen (Stylus), lack of some programs that participants are accustomed to using in computer environment, interference while talking on the phone, difficulty in running a program on PDA and difficulty in entering numbers in PDA.

DISCUSSION

The success of current technologies is based on the practicality of that technology when it is used in any field. The new-world concept, which gives importance to the new developments in social life, to the individual differences and to the educational issues rather than economic wealth of the nation, especially paying attention to the special education might lead the handicapped individuals to get their share from the application of technology into their education sufficiently. The new technologies, which also called mobile technologies, will be the indispensable source of the twenty-first century's technology through conveying their time and place independent features into mobile environments. The handicapped individuals who need special education may even follow the current issues by means of such technologies. The learners especially the ones who need special education, such as handicapped individuals, the students who have to stay at the hospital for their treatments might continue their education by the help of mobile technologies, thus, they can follow the courses without any time and place limitations, they can access the needed information whenever and wherever they want, they can get information about the courses hey missed from their classmates and they can ask and get answers to their questions immediately. Thanks to the Web nets, the mobile technologies have the potential to simultaneously transmit the information that the individuals need.

Like all of the new technological application, the mobile technologies might also have some limitations such as the cost, accessibility and acceptability. However, through practicing new governmental policies for the education of handicapped people, it could be increased the use and availability of mobile technologies in the field of special education. Likewise, through conducting studies similar to the present study, the acceptability, compatibility, effectiveness and practicality of the technology could be examined. The motivating or hindering factors for the students might be identified along with the different special education fields. Thus, the present study revealed that the greatest problem that the hearing impaired students encountered during their use of PDAs, was using the PDAs with hearing aid caused interference (noise). However, orthopedically handicapped students might complaint about the small size key pad of the PDAs. Being the first initiative in cooperation with special education and mobile technology was inspired the researcher of the present study. The researcher believes that a lot more studies can be conducted on this issue in Turkish context. The forthcoming studies on this issue might contribute to enhance the quality of life of the handicapped people as well as contribute to the sustainable development of the country.

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THE IMPACT OF CRITICAL THINKING AND LOGICAL-MATHEMATICAL INTELLIGENCE ON ALGORITHMIC DESIGN SKILLS IN DIFFERENT APPLICATIONS

FARKLI UYGULAMALARDA ELEŞTİREL DÜŞÜNME ve MANTIKSAL-MATEMATİKSEL ZEKÂNIN ALGORİTMA OLUŞTURMA BECERİLERİNE ETKİSİ

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Özet
Bu araştırmanın amacı, doğrudan bir programlama dili öğretilen ile yalnızca algoritma öğretilen öğrencilerin eleştirel düşünme ve mantıksal-matematiksel zekâ düzeylerinin algoritma oluşturma becerilerine etkisini ortaya koyarak, algoritma becerilerini geliştirmeye yönelik önerilerde bulunmaktır. Bu araştırma, sontest kontrol gruplu yarı deneysel hem nicel hem de nitel karakterli bir çalışmadır. Çalışma grubunu 45 öğrenci oluşturmaktadır. Araştırmanın verileri algoritma beceri testi, eleştirel düşünme eğilim ve düzeyleri (α=0,88) ve mantıksal-matematiksel zeka öz algı ölçeği (α=0.925) kullanarak toplanmıştır. Algoritma beceri testi ile elde edilen veriler, bir dereceli puan anahtarı yardımıyla doküman incelemesi yöntemiyle değerlendirilmiştir. Toplanan nicel veriler üzerinde aritmetik ortalama, t ve pearson analizleri yapılmıştır (p<,05). Ulaşılan sonuçlar ise şöyle özetlenebilir: Açık fikirlilik ile meraklılık alt boyutları dışında diğer alt boyutlarda ve toplamda eleştirel düşünme öğrencilerin algoritma geliştirme becerileri üzerinde etkili olmaktadır. Öğrencilerin mantıksal-matematiksel zekâ düzeyleri algoritma geliştirme becerileri üzerinde oldukça etkilidir.
Anahtar Kelimeler: Programlama becerileri , eleştirel düşünme, mantıksal-matematiksel zeka

INTRODUCTION

Students' problems in learning programming skills can certainly be attributed to many factors. Chiefly among them are the inherent complexities of the programming process, the tendency to overlook the fact that this process requires special teaching approaches, the need for strenuous efforts to learn and the lack of skills to use mathematical knowledge in programming process (Lawrence et al., 1994). In addition to such causes as the general lack of knowledge in students about the problem solving process and about how to design a program or algorithm (Lawrence et al., 1994), critical thinking skills frequently used along with the problem solving skill and students' intelligence levels can also be a cause for such failures. In fact, Boulay (1986) particularly makes emphasis on the importance of the problem solving skill in the programming process.

Thinking refers to mental processes such as problem solving, investigating a phenomenon, reflection and criticising based on establishing meaningful links between concepts or events and arriving at conclusions (Yüceliş, 2003; Aybek, 2006). Critical thinking is defined as logical and reflective thinking which focuses on deciding what to do and what to believe (Ennis, 1991: cited in Dam and Volman, 2004). Accordingly, critical thinking is argued to be a significant skill in the problem solving process. The literature contains a great deal of evidence about the contributions of critical thinking to students' academic achievement (Doney, Lephard, 1993: cited in Akbey, 2006; Kaasboll, 1998;Akbıyık, 2002; Kökdemir, 2003;). The contribution of critical thinking to academic achievement is not only limited to courses in certain fields but also covers all courses (Kökdemir, 2003).

There are many other variables that influence learning apart from critical thinking skills. Chiefly among them concerns students' intelligence levels. The Theory of Multiple Intelligences developed by Gardner takes intelligence as a fundamental variable that affects learning. Gardner (1999) defines intelligence as an individual's capacity to create products that are valued within one or more cultural settings; the skill to produce efficient solutions to real-life problems; or the ability to discover new or complex problems that require solutions. In order to add broader insights to the issue of intelligence in his theory, Gardner (1997) termed the abilities and potentials acquired in different ways by people as "intelligence domains". The theory argues that there exist important relations between intelligence types and learning styles (Gardner, 1989).

With regard to the characteristics concerning programming skills, particularly logical-mathematical intelligence arguably gains prominence over other domains. In fact, Saban (2002) argues that individuals with strong logical-mathematical intelligence are successful in categorising objects, establishing logical links between events, and establishing some abstract relationships between events by quantifying and calculating certain properties of objects. Such skills are usually those that are needed in the programming process. Therefore, the present study only addresses this particular aspect of the theory of multiple intelligences. In the light of the above discussions, one could suggest that critical thinking skills and logical-mathematical intelligence levels may influence students' programming skills. Furthermore, the effects of these variables may differ in two different instructional applications i.e. direct teaching of a programming language and simply teaching algorithms. On the basis of this basic assumption, the study aims to reveal the impact of critical thinking and logical-mathematical intelligence levels of students who were directly taught a programming language and those who were only taught algorithm upon their algorithm design skills and to offer suggestions to enhance algorithm skills.

Sub-Problems:

1. How are students' algorithm design skills influenced by their critical thinking dispositions and levels?
2. What is the relationship between students' algorithm design skills and critical thinking skills?
3. How are students' algorithm design skills influenced by their Logical-Mathematical intelligence levels?
4. What is the relationship between students' algorithm design skills and their Logical-Mathematical intelligence levels?

METHOD

The present study is a posttest control group semi-experimental study with both quantitative and qualitative character. The sample consists of a total of 45 students in their first year in the Department of Computer, and Instruction Technologies in an Education Faculty.

For five hours a week for four weeks, experiment group I was taught the concepts of program, command, algorithm, flow chart, constant, condition, and cycle, and example questions were analysed about how to develop an algorithm. The students were presented with explanations and examples about what strategies they should follow in the problem solving process. At every stage of the instruction, the students were made to develop algorithms to solve different exemplary problems and were provided with instant feedback and corrections for their mistakes. At the end of each session, they were given problem statements as extracurricular activities, which they were asked to solve for the next session. The assignments were checked at the beginning of each session and appropriate feedback and corrections were provided.

Similarly, for five hours a week for four weeks, experiment group II was also taught the concepts of variable, Visual Basic editor, program, command, algorithm, flow chart, constant, condition, cycle and basic commands in Visual Basic. Next, example questions were analysed about how to develop program piece. The students were presented with explanations and examples about what strategies they should follow in the problem solving process. At every stage of the instruction, the students were made to develop code pieces to solve different exemplary problems, and were provided with instant feedback and corrections for their mistakes. At the end of each session, they were given problem statements as extracurricular activities, which they were asked to solve for the next session. The assignments were checked at the beginning of each session and appropriate feedback and corrections were provided.

The following data collection instruments were used to collect the necessary data.

a. Algorithm Skill Test: In order to measure algorithm development skills, the students were administered a test form containing four open-ended algorithm questions. The students were asked to write down the solution they project to solve the problem in each question, to write the algorithm and to draw the flowchart for their solutions, and to prepare check tables for the algorithm.

b. Critical Thinking Dispositions and Levels: The study data were collected from the target groups using the California Critical Thinking Disposition Inventory (CCTDI). Originally written in English, the inventory was translated into Turkish and was subjected to the required validity and reliability analyses by Kökdemir (2003). Composed of a total of six subscales and 51 items, the new version of the inventory had an internal consistency coefficient (alpha) of 0.88. The total variance explained by the inventory was found to be 36.13%.

c. Logical-Mathematical Intelligence Self-Perception Scale: In order to determine the students' logical-mathematical intelligence levels, we used the Logical-Mathematical Intelligence Self-Perception Sub-Scale – suggested for independent use – from the Multiple Intelligences Self-Perception Scale

developed by Yeşil and Korkmaz (2010). The Logical-Mathematical Intelligence Self-Perception Scale has an internal consistency coefficient of Cronbach Alpha=0.925.

The data obtained through the algorithm skill test were evaluated using a rubric. The rubric includes three categories: 'problem analysis', 'solution design', and 'mathematical transfer'. Analysis and solution design are among the stages of the problem-solving process (Schoenfeld, 1992; Harskamp, Suhre, 2007; Kızılkaya, Aşkar, 2009). Mathematical transfer refers to the mathematical expression of a solution. One cannot algorithmatise a solution that cannot be mathematically expressed. Therefore, it may be useful to consider in this process mathematical transfer skill along with the stages of problem-solving skill. Skills that could be included under each category were identified by a literature review, and with the help of four field experts including a computer engineer, a software engineer and two education technologists.

The skills under each category were separately examined by the researchers. Each skill was rated with "0" in cases where students failed to respond or gave fully wrong responses, with "1" when there were incomplete responses or small errors, and with "2" when the response was correct. Thus, each question was evaluated for ten different skill levels and with a rating range between 0 and 20. Each category and total scores were then converted into standard scores ranging between 20 at the minimum and 100 at the maximum. These categories can be summarised as: a. Problem Analysis: 1. The ability to express a problem as a whole, 2. The ability to verbally express a solution, 3. The ability to correctly design a solution. b. Solution Design: 1. Ability to algorithmically express a solution, 2. Ability to correctly use the variables, 3. Accuracy of cycles, 4. Accuracy of Condition Statements, 5. Brevity of the algorithm. c. Mathematical Transfer: 1. Accuracy of the Mathematical Operators Used, 2. Mathematical expression of the solution.

To analyse the data about critical thinking, responses were collected using the Likert-type scale with six intervals added and raw scores were computed for each of the sub-dimensions; next, these raw scores were divided by the number of questions, the result being multiplied by 10 and converted to a standard score of six at the minimum and 60 at the maximum. The lowest and highest possible scores for all sub-scales are fixed. The scores obtained on the basis of the students' responses to the five-point Likert-type Logical-Mathematical intelligence scale do not exhibit a standard quality due to the differences in the number of items under the factors. Thus, the raw scores obtained were converted to standard scores, which were 20 at the minimum and 100 at the maximum. In the framework of the study's sub-problems, the collected data were subjected to arithmetic means, t test and Pearson's r correlation test analyses. The level of $p<.05$ was deemed to be sufficient for significant differences.

RESULTS

1. Differences among the Groups' Critical Thinking Dispositions and Levels According to the Posttest

Table 1. Intergroup Differences of Critical Thinking Dispositions and Levels

Critical Thinking Dispositions and Levels / Groups		N	$\overline{X}$	Ss.	T	sd	p
Analyticity	I. Experimental Group	22	40,05	6,028	-,676	43	,503
	II. Experimental Group	23	41,13	4,684			
Open-mindedness	I. Experimental Group	22	36,41	5,369	-1,552		,128
	II. Experimental Group	23	38,70	4,497			
Inquisitiveness	I. Experimental Group	22	37,64	6,012	-,247		,806
	II. Experimental Group	23	38,04	5,032			
Self-confidence	I. Experimental Group	22	39,14	6,628	-2,460		,018
	II. Experimental Group	23	43,91	6,395			
Truth-seeking	I. Experimental Group	22	38,32	4,735	,101		,920
	II. Experimental Group	23	38,17	4,877			
Systematicity	I. Experimental Group	22	37,86	6,402	-,997		,325
	II. Experimental Group	23	39,52	4,660			
Total	I. Experimental Group	22	229,45	22,125	-1,636		,109
	II. Experimental Group	23	239,26	17,958			

As shown in Table 1 the students' mean scores in the sub-dimensions of overall critical thinking dispositions and levels range between 36.41 and 43.91, while overall means are $\overline{X}$ =229.45 for the group simply taught the algorithm process and $\overline{X}$ =239.26 for the students who were directly taught a programming language. Thus, it is clear that most of the students have a low level of critical thinking dispositions and levels. On the other hand, there was only a significant intergroup difference in favor of the group directly taught a programming language only in the self-confidence sub-dimension of critical

thinking dispositions and levels ($t_{(2-43)}$=-2.460, p<0.05), while no significant difference was found with regard to the other sub-dimensions and total scores. Accordingly, it could be argued that students who were directly taught a programming language have significantly greater self-confidence when compared to those simply taught algorithms.

2. Relationship between Algorithm Design Skills and Critical Thinking Skills

Table 2. Relationship between Students' Algorithm Skill Levels and Critical Thinking Dispositions and Levels

Critical Thinking Dispositions and Levels / Groups		Algorithm Design Skills			
		Analysis	Design	Mathematical Transfer	Total
Analyticity	Pearson r	,466**	,650***	,694***	,713***
	p	,001	,000	,000	,000
Open-mindedness	Pearson r	-,108	,085	-,040	-,011
	p	,479	,578	,795	,944
Inquisitiveness	Pearson r	,140	,395**	,244	,334*
	p	,360	,007	,106	,025
Self-confidence	Pearson r	-,072	-,085	-,129	-,109
	p	,640	,578	,397	,475
Truth-seeking	Pearson r	,426**	,515***	,464**	,565***
	p	,003	,000	,001	,000
Systematicity	Pearson r	,320*	,639***	,612***	,630***
	p	,032	,000	,000	,000
Total	Pearson r	,303*	,560***	,468**	,541***
	p	,043	,000	,001	,000

N=45; *:p<0,05; **: p<0,001; ***:p<0,000

As is clear from Table 2, there is a significantly positive relationship both between the students' total scores in the algorithm design skills sub-dimension and analyticity, truth-seeking and systematicity; total scores in inquisitiveness and critical thinking and all sub-dimensions and total scores about algorithm design skills (p<0.05). On the other hand, no relationship was detected between the sub-dimensions of open-mindedness and self-confidence and all sub-dimensions of algorithm design skills; the inquisitiveness sub-dimension and the analysis sub-dimension of algorithm design skill. Thus, it could be argued that with an increase in the total scores of critical thinking dispositions and levels and analyticity, truth-seeking, and systematicity levels, a parallel increase occurs in all sub-dimensions and total scores of algorithm design skills. Moreover, it is interesting that with an increase in inquisitiveness level, only the total scores in algorithm skills and the scores in the designing sub-dimension increase.

3. Intergroup Differences between Logical-Mathematical Intelligence Self-Perception Levels According to Posttest Results

Table 3. Logical-Mathematical Intelligence Levels of Student Groups

Logical-Mathematical Intelligence / Experimental Groups		N	$\overline{X}$	Ss.	t	sd	P
Mathematical Transfer	I. Experimental Group	22	65,55	12,157	-1,126	43	,266
	II. Experimental Group	23	69,52	11,536			
Mathematical Relationship	I. Experimental Group	22	63,18	9,898	,219		,828
	II. Experimental Group	23	62,48	11,587			
Logical Relationship	I. Experimental Group	22	73,09	17,035	-,174		,863
	II. Experimental Group	23	73,87	12,850			
Total	I. Experimental Group	22	67,18	12,003	-,400		,691
	II. Experimental Group	23	68,57	11,184			

Table 3 reveals that in terms of the students' logical-mathematical intelligence levels, their mean scores in the sub-dimensions range between 62.48 and 73.87. Overall means are $\overline{X}$ =67.18 for the students in experiment group I (the group simply taught algorithms) and $\overline{X}$ =68.57 for experiment group II (the group directly taught a programming language). Thus, arguably, most students have a moderate

level of logical-mathematical intelligence levels. On the other hand, there are no intergroup differences with regard to the logical-mathematical intelligence sub-dimensions and total scores (p>0.05).

4. Relationship between Algorithm Design Skills and Logical-Mathematical Intelligence Levels

Table 4. Relationship between Students' Algorithm Skill Levels and Logical-Mathematical Intelligence Levels

Logical-Mathematical Intelligence		Algorithm Design Skills			
		Analysis	Design	Mathematical Transfer	Total
Mathematical Transfer	Pearson r	,521(**)	,651(**)	,662(**)	,729(**)
	p	,000	,000	,000	,000
Mathematical Relationship	Pearson r	,406(**)	,559(**)	,489(**)	,591(**)
	p	,006	,000	,001	,000
Logical Relationship	Pearson r	,425(**)	,681(**)	,657(**)	,709(**)
	P	,004	,000	,000	,000
Total	Pearson r	,483(**)	,694(**)	,662(**)	,740(**)
	P	,001	,000	,000	,000

N=45

Table 4 demonstrates that there exists a significantly positive relationship both between the students' total scores and all the sub-dimensions of algorithm design skills and their total scores and all the sub-dimensions of logical-mathematical intelligence (p<0.05). As a result, it could be argued that as logical-mathematical intelligence levels increase, all sub-dimensions and total scores of algorithm design skills show a parallel increase.

CONCLUSION AND DISCUSSION

Students directly taught a programming language are significantly more self-confident when compared to those simply taught algorithms. Students directly taught a programming language have the opportunity to spontaneously test the solutions they themselves developed to solve the problems they encounter using Visual Basic editor and they can see and immediately correct the mistakes in their solutions. This opportunity may have influenced the students' self-confidence. It is an interesting finding that in the open-mindedness and self-confidence sub-dimensions, the students' algorithm designing skills are negatively influenced and particularly in the self-confidence sub-dimension, this negative influence reaches a significant level. Nevertheless, the students' total critical thinking scores and their scores in other dimensions significantly differ in favor of the moderate-scoring group. In other words, except for the sub-dimensions of open-mindedness and inquisitiveness, in all other sub-dimensions and overall scores, critical thinking is influential on students' algorithm design skills. The process of producing algorithms can in fact be considered as a direct process of problem solving, one of the distinctive characteristics of which is the thinking skill (Özden, 2006; cited in Canan-Günhan, Başer, 2009). Özden also argues that critical thinking skill is among the most widely known thinking skills. As suggested by Elias, Kress (1994), it is natural for students with critical thinking skills to be more successful in academic terms. For this reason, apart from open-mindedness and inquisitiveness, analyticity, self-confidence, truth-seeking and systematicity sub-dimensions and total critical thinking scores contributed to the students' programming skills, which could also be regarded as a natural result.

Students' logical-mathematical intelligence levels are highly influential on their algorithm designing skills. As their logical-mathematical intelligence levels increase, there is a parallel increase in all sub-dimensions and total scores regarding algorithm design skills. This result is in agreement with those presented in the literature. Logical-mathematical intelligence refers to the ability to think numerically, calculate, deduce, establish logical links, produce hypotheses, solve problems, think critically, be familiar with abstract symbols such as numbers and geometrical shapes, and establish connections between pieces of information (Köksal, 2006). Individuals with this type of intelligence tend to choose computer programming as a profession among others (Ekici et al., 2008).

SUGGESTIONS

When teaching programming skills, it could be suggested to take care to concretise the offered solutions using an algorithm simulation or a programming language editor, instead of simply teaching algorithms or teaching a programming language on paper. At each and every step of the instruction process, measures should be taken to improve students' critical thinking skills. One of the main

requirements to benefit from computers' many advantages is to possess programming skills. It is particularly indispensable for the instructors of computer technologies to posses these skills at good levels. Nevertheless, the literature contains a limited number of studies on teaching programming skills. In particular, there is a need for further research on the methods to be used for better teaching of these skills and the variables that could affect these skills.

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THE INFLUENCE OF ENTREPRENEURSHIP COGNITON ON ENTREPRENEURIAL LEARNING BEHAVIOR IN THE E-COMMERCE

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ABSTRACT
This study examines 326 technical and vocational school students' entrepreneurial learning behavior and its influencing factors to serve as a school reference for the development of entrepreneurship education measures. The results show that students' 'computer self-efficacy (CSE)' has a significant direct effect on 'entrepreneurial learning behavior (ELB)', and 'entrepreneurship cognition (EC) 'has a significant effect on 'entrepreneurial learning behavior' through 'computer self-efficacy.' The influence pattern and empirical data of 'entrepreneurship cognition 'and 'computer self-efficacy' on 'entrepreneurial learning behavior' has a good fit.
Key Words: Entrepreneurship cognition; entrepreneurial learning behavior; computer self-efficacy.

INTRODUCTION

The service industry occupies a large of percentage in the industrial structure in Taiwan, especially insurance, fixed property, retail, wholesale and so on. Some factors influencing business management style and employment include scientific innovation investment, alliance chains, and on-line entrepreneurship (Chou, 2010; Dyer, Gregersen & ChristnCSEn, 2009).

The small and medium-sized enterprise platform supported e-commerce business counseling service to members includes e-commerce business, independent business, network marketing, and benchmarking e-commerce business. This small and medium-sized enterprise platform counseled 88 industrial associations from 2009 to 2010, and assisted more than 9,000 small and medium-sized enterprise application e-commerce opportunities. It also set up approximately 1,000 enterprise e-commerce web sites for women entrepreneurs (DGBAS, 2011; SMEA, 2011).

As the domestic unemployment rate climbs, employment-oriented technical and vocational education programs urgently need to find the teaching resources for entrepreneurship education in Taiwan. The difficulty currently faced by students of technological and vocational schools in their learning careers cannot be solved with a confinement to school employment (Chou, 2010; Sobel, & King, 2008).

Entrepreneurship education plays the role of helping to reduce the unemployment rate in a country. Entrepreneurship learning behavior explores the students' entrepreneurship learning result and entrepreneurship learning attitude on the entrepreneurship and business field and at the same time providing entrepreneurial experiences in the process of learning entrepreneurship ability and belief in the entrepreneurship curriculum (Chou, Shen, Hsiao & Chen, 2010a; Gurel, Altinay & Daniele, 2010; Van Dam, Schipper, & Runhaar, 2010; Todorovic, McNaughton & Guild, 2011; Yemini, & Haddad, 2010).

Some research found students' experiences of learning entrepreneurship cognition and computer self-efficacy have provided them with chances to learn new entrepreneurship skills, which may be helpful for their future entrepreneurs(Brigham, De Castro & Shepherd, 2007; Dyer, Gregersen & Christnesen, 2009; Haynie, & Sepherd, 2009; Kicjul, Gundry, Barbosa & Whitcanack, 2009). Entrepreneurship cognition define cognitive adaptability as the ability to effectively and appropriately change entrepreneurship learning behavior and given feedback from the entrepreneurship education learning context in which cognitive processing is embedded. Research suggests that computer self-efficacy is important to affect entrepreneurship learning result. It is positively related to student belief, ability, and attitude in contexts that can be characterized as complex, dynamic, and inherently uncertain.

PURPOSES OF THIS STUDY

The paper, Analysis of factors in technological and vocational school students perceived entrepreneurship cognition and entrepreneurial learning behavior, using computer self-efficacy as a mediator variable, discussed the variables which may influence vocational student's entrepreneurial

learning behavior and found the relationships among the variables. The purposes of this study are to address the 4 following issues.

1. There is no significant correlation between technological and vocational school students' entrepreneurship cognition and entrepreneurial learning behavior.
2. There is no significant correlation between technological and vocational school students' perceived entrepreneurship cognition and computer self-efficacy.
3. There is no significant correlation between technological and vocational school students' computer self-efficacy and entrepreneurial learning behavior.
4. Influence models of technological and vocational school students' entrepreneurship cognition, computer self-efficacy, and entrepreneurial learning behavior fit the data collected by this study.

REVIEW OF LITERATURE

Entrepreneurship Cognition

Some metacognition research, and integrated with related entrepreneurship education in social cognition, and entrepreneurship cognition has five theoretical dimensions: goal orientation, metacognitive knowledge, metacognitive experience, metacognitive control, and monitoring (Brigham, De Castro & Shepherd, 2007; Haynie, & Sepherd, 2009; Kicjul, Gundry, Barbosa & Whitcanack, 2009).

There are three issues could be to conducted further investigation and serve as thee entrepreneurship cognition for this study. First, there remains some debate on whether an EC construct is even necessary. Several scholars advocate the use of a general measure of metacognition instead of a domain-specific EC construct. Second, the dimensionality of the construct has yet to be fully established. While most scholars acknowledge the multi-dimensional nature of the EC construct (Brigham, De Castro & Shepherd, 2007; Haynie, & Sepherd, 2009; Kicjul, Gundry, Barbosa & Whitcanack, 2009), very few researchers have explicitly examined the underlying dimensions that make up the actual construct by using some type of theoretical model of entrepreneurial activity and tasks.

Moreover, several scholars have simply relied on single survey questions to capture an individual's level of EC. Finally, very few studies have included a sampling of nascent entrepreneurs. Rather, most of the initial studies of CSE relied on samples of university students or samples of small business owners (Haynie & Sepherd, 2009; Kicjul, Gundry, Barbosa & Whitcanack, 2009).

Computer Self-Efficacy

Computer self-efficacy is an individual's judgment of their computer competence (Chou, Shen, Hsiao, & Chen, 2010b; Vajargah, & Jahani, 2010). The current study examines students' self-efficacy beliefs with regard to their computer literacy skills. It is emphasized that computer self-efficacy reflects individual perceptions and abilities to fulfill job requirements of computer competence, which is not related to practical computer skills (Wilfong, 2006).

Some research suggests that computer self-efficacy may be an important factor related to the acquisition of entrepreneurial skills in the e-commerce industry (Vajargah, & Jahani, 2010). A review of the literature indicates CSE has been investigated in similar settings; however, it has not been thoroughly investigated as an additional assessment tool in this important entrepreneurial educational context.

Mars & Garrison (2009) claimed that students' attitudes toward computers were critical issues in entrepreneurial education courses and entrepreneurial-based curricula. Todorovic, McNaughton & Guild (2011) concluded that monitoring the user's attitudes toward computers should be a continuous process if the computer is to be used as an entrepreneurial tool.

Based on the above, for students, there is a close correlation between computer self-efficacy and entrepreneurial learning results (Vajargah, & Jahani, 2010; Verzat & Bachelet, 2006; Mars & Garrison, 2009). Researchers have proposed that positive attitudes toward entrepreneurial cognition, high computer self-efficacy and entrepreneurship attitude could be important factors in helping student learn entrepreneurial learning behavior.

Entrepreneurial Learning Behavior

Entrepreneurial learning behavior includes students' entrepreneurial learning result and entrepreneurial learning attitude to accomplish entrepreneurship education learning. Technical and Vocational School Students will participate in entrepreneurial education that they prefer learning benefits over entrepreneurial cognition and a high rate of entrepreneurial self-efficacy(Sobel, & King, 2008; Gurel, Altinay & Daniele, 2010; Yemini, & Haddad, 2010).

Entrepreneurial learning behavior through undergraduates' immediate involvement in carrying out entrepreneurship education are also hoped to spark interest besides giving a clearer perception for the students concerning the entrepreneurial world, and reduces the rate of unemployment among graduates(Chou, 2010; Chou, Shen, Hsiao & Chen, 2010a).

The research's findings also indicate 'computer self-efficacy' in individual's entrepreneurship response towards the field of entrepreneurship which is affected by important factor (Dyer, Gregersen & Christnesen, 2009; Haynie & Sepherd, 2009; Kicjul, Gundry, Barbosa & Whitcanack, 2009; Van Dam, Schipper, & Runhaar, 2010). According to Kirzner (2009) conducted that in terms of attitude towards the involvement in the entrepreneurship education programme. Haynie & Sepherd (2009) stated that computer self-efficacy through perception of entrepreneurial belief and ability. Previous empirical research provides conclusive evidence on the differences of response undergraduates. Thus, present study aims to identify the effect of 'entrepreneurship cognition ', 'computer self-efficacy', and 'entrepreneurial learning behavior'.

METHODOLOGY

Subjects

This study treats students from technological and vocational schools as the population, and adopts random sampling and cluster sampling for survey. A total of 326 valid samples were collected, and the analysis of their gender, work experience, current post, teaching background, and school attributes is shown in Table 1

Table 1 Distribution of participants' background in formal scales

Basic information	Group	No of people	%
Gender	Male	172	52.9%
	Female	154	47.1%
Work experience	1 years (and below)	84	26.0%
	More than 1 years and less than 3 years	104	31.8%
	More than 3 years and less than 5 years	94	28.8%
	Over 5 years	44	13.4%
Current post	Full-time students	124	38.0%
	Part-time students	202	62.0%
Learning background	Science, engineering, agriculture and design	98	30.1%
	Business, management, tourism and recreation	185	56.6%
	Livelihood, health and medical care	18	5.6%
	Liberal arts, law, education and general knowledge	25	7.7%
School attributes	Public	170	52.1%
	Private	156	47.9%

Measures

A 41-item survey questionnaire was developed to measure participants' entrepreneurial cognition, computer self-efficacy, entrepreneurial learning behavior, and demographic information. The research tool is a 'Questionnaire of Factors Which Influence Technical and Vocational School Students' Entrepreneurial Learning Behavior.' The questionnaire includes Entrepreneurship cognition Scale, Computer self-efficacy Scale and Entrepreneurial Learning Behavior Scale (Chou, Shen, Hsiao, & Chen, 2010; Dyer, Gregersen, & ChristnCSEn, 2009; Haynie, & Sepherd, 2009; Kirzner, 2009; McGee, Peterson, Mueller & Sequeira, 2009; Mars, & Garrison, 2009; Todorovic, McNaughton & Guild, 2011). The scales' factors, number of questions reliability and validity are shown in Table2.

Table 2. An overview of factors, number of questions, reliability and validity for technical and vocational school students' entrepreneurship cognition, computer self-efficacy and entrepreneurial learning behavior scale.

Entrepreneurship cognition Scale				Computer self-efficacy Scale				Entrepreneurial learning behavior Scale			
Factor name	No. of questions	Cronbach α	Factor loading	Factor name	No. of questions	Cronbach α	Factor loading	Factor name	No. of questions	Cronbach α	Factor loading
Goal orientation	5	.83	25.52%	Playfulness	3	.90	28.24%	Entrepreneurial learning result	5	.88	34.52%
Cognitive knowledge	6	.87	23.41%	Ease of use	3	.87	19.44%	Entrepreneurship toward venturing	4	.84	18.21%
Cognitive experience	4	.83	19.58%	Effectiveness	3	.83	17.23%	Employment attitude	5	.86	14.92%
				Usefulness	3	.84	4.52%				
Total reliability Cronbach α		.88		Total reliability Cronbach α		.91		Total reliability Cronbach α		.89	
Accumulated explained variance			68.51%	Accumulated explained variance			69.43%	Accumulated explained variance			67.65%

The 'Questionnaire of Factors Which Influence Technical and Vocational School Students' Entrepreneurial Learning Behavior' was reviewed by three experts for subject contents' suitability to ensure the scale's expert validation. Five technical and vocational school students were invited to answer the questionnaire to enhance the validity of the scale's contents. In addition, five technical and vocational schools were selected for a pre-test, and 74 students were selected as the pre-test objects in total. The

scales used in this study are in self-assessment form, and a Likert 5-point scale is used as the scoring method. There are five levels of choices from 'agree' to 'do not agree;' five equal portions of 5, 4, 3, 2 and 1 are distinguished according to the extent of agreement, and 5 points, 4 points, 3 points, 2 points and 1 point are given in this order. The higher the score an individual receives, the larger extent of agreement the individual has.

Data analysis

In processing the survey data used in this study, the collected questionnaires were coded, and Statistical Package for Social Science (SPSS version 12.0) and linear structural analysis (LISREL version 8.5) were used to verify the correlation among the factors of 'entrepreneurship cognition,' 'computer self-efficacy' and 'entrepreneurial learning behavior' variables and their effects in order to achieve the purpose of this study. In this study, the statistical test level $\alpha = 0.05$.

RESULTS

The empirical results of technical and vocational school students' entrepreneurial learning behavior are shown in Figure 1, and are analyzed as follows: The estimated value of the direct affecting parameter between 'entrepreneurship cognition 'and 'computer self-efficacy' is 0.83 ($t = 6.13$, $p<.05$). This means that 'entrepreneurship cognition' has a significant effect on 'computer self-efficacy.'

The estimated value of the direct affecting parameter between 'entrepreneurship cognition 'and 'entrepreneurial learning behavior' is 0.42 ($t = 2.52$, $p>.05$). This means that 'entrepreneurship cognition' does not necessarily have a significant effect on 'entrepreneurial learning behavior'. The estimated value of the direct affecting parameter between 'computer self-efficacy' and 'entrepreneurial learning behavior' is 0.89 ($t = 4.28$, $p<.05$). This means that 'computer self-efficacy' has a significant effect on 'entrepreneurial learning behavior.'

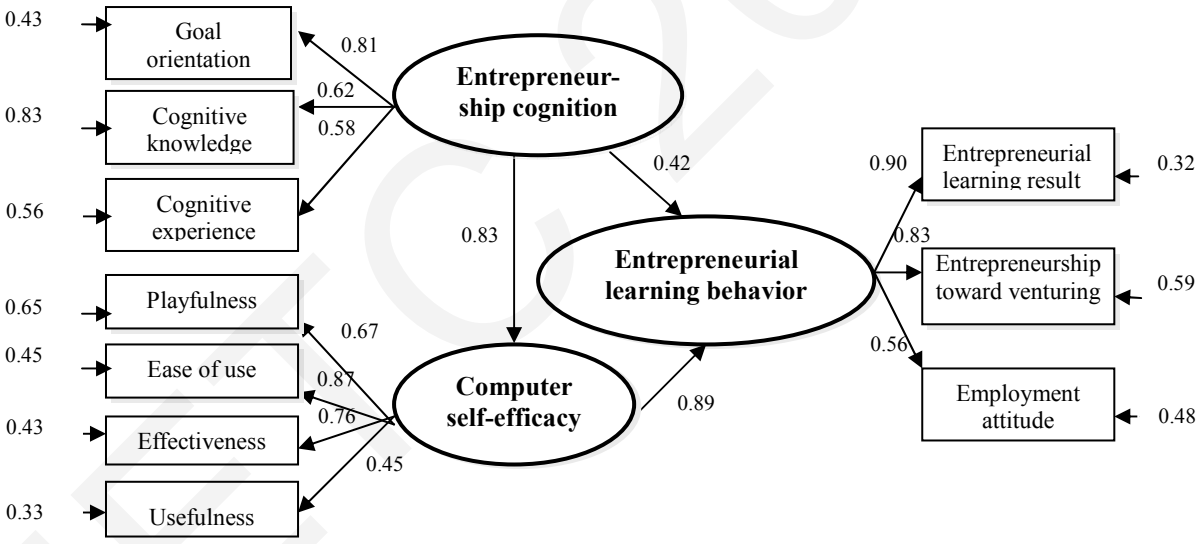

Figure 1. Path of technical and vocation school students' entrepreneurial learning behavior.

In summary, in this study of technical and vocational school students' entrepreneurial learning behavior and its influence pattern, 'entrepreneurship cognition' has a significant effect on 'computer self-efficacy,' but does not have a significant effect on 'entrepreneurial learning behavior.' 'Computer self-efficacy' has a significant effect on 'entrepreneurial learning behavior.

DISCUSSION

Students' 'computer self-efficacy' has a significant direct effect on 'entrepreneurial learning behavior,' and 'entrepreneurship cognition' has a significant effect on 'entrepreneurial learning behavior' through 'computer self-efficacy.' The influence pattern and empirical data of 'entrepreneurship cognition' and 'computer self-efficacy' on 'entrepreneurial learning behavior' has a good fit. The influence effects of 'entrepreneurship cognition' 'computer self-efficacy' and 'entrepreneurial learning behavior' shows that for technological and vocational school students, the influence of 'entrepreneurship cognition ' on 'entrepreneurial learning behavior' comes mainly through their awareness of 'computer self-efficacy.' In addition, 'computer self-efficacy' has a direct and significant effect on 'entrepreneurial learning

behavior.' From the influence of entrepreneurship cognition, computer self-efficacy and entrepreneurial learning behavior, we can clearly see that compared with entrepreneurship cognition, computer self-efficacy has a greater influence on entrepreneurial learning behavior (Bustos-Orosa, 2008; Dyer, Gregersen, & ChristnCSEn, 2009; Mars, & Garrison, 2009).

Regarding the test results, according to the goodness of fit test standard by Hair et al, the model in this study has a good overall fit (Hair, Anderson, Tatham, & Black, 1998). In the absolute fitness and incremental fitness tests, all indices meet the standard, and have the best fit. Most of the parsimonious fitness indices meet the test standard, and have a good fit. Overall, in the entrepreneurial learning behavior and its influence model established in the study based on theories, both the model and the data have a good fit, and in the parameter estimation most of the estimated values are significant. This shows that all the indices of latent variables have their importance, and only the parameter value of 'entrepreneurship cognition 'on 'entrepreneurial learning behavior' is low. Overall, the empirical data have a good explanatory power.

Students' 'entrepreneurship cognition' influences 'computer self-efficacy' and 'benefits of entrepreneurship' is an important factor which influences 'computer self-efficacy'. Students' 'computer self-efficacy' influences 'entrepreneurial learning behavior', 'belief" and 'ability' are important factors which influence 'entrepreneurial learning behavior'(Haynie & Sepherd, 2009; Prosser, Martin, Trigwell, Ramsden & Middleton, 2008; McGee, Peterson, Mueller & Sequeira, 2009).

The results show that among all latent variables in the model, the direct influence of 'entrepreneurship cognition ' on 'entrepreneurial learning behavior' is not significant, indicating that the assumed influence of 'entrepreneurship cognition ' on students' 'entrepreneurial learning behavior' needs further testing; this is something worthy of a more in-depth study and validation in the future. Based on test results, although the overall result is acceptable, the model consistency level is not entirely satisfactory, and its entrepreneurship cognition has a relatively low explanatory power for entrepreneurial learning behavior. The possible reasons are:

The measurement error variance of the three main variables in the model is too large. Although in the course of the investigation in this study each step was made following reasonable procedures, in a sample survey there are a survey bias and restrictions on the study objects in answering the questionnaire. These can result in a bias between the survey data and the actual situation (Bentler & Bonett, 1980; Hair, Black, Babin & Anderson, 2010; Verzat & Bachelet, 2006).

The influence is test of indices and method. Currently in the verifying calculation of structural equations, the index value is subject to the sample size, and sometimes the index value may influence each other. When the index is far greater than or much lower than the standard value, the judgment is more accurate; when the index is close to the standard value, we then need to consider the possible influence from the error of the missing scope of variables. Although a complete research model was tried to be established in this study based on past researches and theories, there has been little domestic research on the topic of students' entrepreneurial learning behavior.

IMPLICATION

There may be undetected factors which resulted in a low explanatory power, and there are other variables which have not been identified (Jones & Iredale, 2006; Shinnar, Pruett & Toney, 2009). Regarding this model's test results, perhaps in the future a further study can be conducted to find the variables either missing in the theories or can be further added or deleted, or more comprehensive empirical data can be collected for testing to improve the consistency between this model and empirical data.

ACKNOWLEDGMENT

This paper was written while the authors were supported by a grant from the National Science Council, Republic of China (NSC 99-2511-S-224 -001 -MY3)

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THE INTER-REGIONAL INEQUALITY OF ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGY IN TURKEY BASED ON PISA 2009 DATA

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Abstact
The purpose of this study was to investigate the extent to which students from Turkey have access to a computer and the internet at school and at home, and differences in ICT accessibility by geographic region based on the data obtained from the PISA 2009. Data collected through the ICT questionnaire were analyzed by descriptive statistical indexes such as percentage technique. Important findings from the study indicated (i) access to a computer and the internet at school and at home in Turkey is still very low; (ii) Western Anatolia is the best region. The region is above the average of country in the accessibility of ICT; (iii) South Eastern Anatolia is the worst region. The region is below the average of country in the accessibility of ICT. These findings confirm that developing countries in general tend to have limited computer and the internet access at school and at home.

Key Word: Information and communication technology, inter-regional differences, NUTS, PISA 2009, Turkey

INTRODUCTION

Information and Communication Technology (ICT) has provided enormous opportunities for developments all around the world (Kari, 2007). Rapid growth and development in ICT has conduced to the diffusion of technology in education (Corbett & Willms, 2002); therefore, ICT is nowadays indispensable for educational studies, such as surveys, presentations, project work or research, online and distant learning. ICT is not only the basis of learning environment, but also it enables individuals to have lifelong learning, improve educational outcomes, learn new occupational skills and decrease inequities between groups (Çavaş, Kışla, & Twining, 2004). Having access to and using ICT at home and at school is played a crucial role in developing technical skills, processing information, getting source material and new information (Sinko & Lehtinen, 1999; Symons, 1997) Similarly, equitable and high-level access to ICT at home and at school play an important role of child development (Corbett & Willms, 2002).

People from Turkey continue to have a slow uptake of new technology. For example, the percentage of computer access in home was 17.65 and the percentage of internet access in home was 13.93 based on Turkish Statical Institute 2005 data. According to PISA 2003 data, computer access in Turkish schools were much lower compared to OECD average (Aşkar & Olkun, 2005) and students in developing countries such as Mexico, Turkey and Tunisia had the highest proportion of students who had never used a computer with 13 per cent, 14 per cent and 39 per cent of students respectively in this category and the largest gender differences was found in Turkey where 21 per cent of females and 9 per cent of males reported never having used a computer. Results showed that approximately 50 per cent of students from Turkey had access to a computer at school and fewer than 40 per cent of students from Turkey had access to a computer at home (Thomson & De Bortoli, 2007). From these data it was found that only 14 per cent of students from Turkey had link to the internet at home (Ainley & Searle, 2005). In Turkey, there is about 15 million students enrolling in grades K-12, we would anticipate that a considerable number of K-12 students do not have access to a computer and the internet from their school and home. The under use of ICT in education may be arisen from illiteracy, inequality, low levels of living, low productivity, poverty (Kessy, Kaemba, & Gachoka, 2006) and inter-regional differences. Students of inequality of access to ICT are called the “digital divide” (Becker, 2000; Wolff & MacKinnon, 2002). Several researches (Ainley & Searle, 2005; Aşkar & Olkun, 2005; Corbett & Willms, 2002; Gündüz, 2010 Mallon, Monseur, Quittre, & Wastiau, 2010; Thomson & De Bortoli, 2007) related to digital divide were examined to access and use of ICT in participant countries by gender, by socioeconomic background, by geographic location and by state using data from international benchmarking studies. Therefore,

international benchmarking studies provide potential insights for the participant countries to assess their educational opportunities with a critical eye.

The Programme for International Student Assessment (PISA), which was conducted with the support of Organization for Economic Cooperation and Development (OECD), is the largest international benchmarking study focusing on curriculum based learning outcomes. The survey has been conducted every three years since 2000 and the PISA was carried out with the participation of 43 countries in 2000, 41 countries in 2003, 56 countries in 2006 and lastly, 65 countries in 2009. Each cycle evaluates the three domains concurrently, with the importance to the one particular domain each time: reading literacy in 2000, mathematical literacy in 2003, and scientific literacy in 2006 and again reading literacy in 2009. With its student and ICT questionnaire, the PISA also collects data concerning students' socio-demographic status, school environments, learning styles, parents, views about themselves, motivation to perform well in related domains and computer familiarity.

The purpose of this study was to investigate the extent to which students from Turkey have access to a computer and the internet at school and at home, and differences in ICT accessibility by geographic location based on the data obtained from the PISA 2009.

METHOD

The study adopted the descriptived survey research method with the student ICT questionnaire in PISA 2009 as the instrument. The data used in this study were provided by the international PISA web site. Data of the study were analysed with SPSS 13.0 program. The percentage technique is used to present and analyse data with appropriate tables.

Participants

The tests and surveys of PISA 2009 project were conducted in April 2009 among 4996 students from Turkey. The students were randomly selected from 170 schools, from 12 NUTS (Nomenclature of Territorial Units for Statistics) regions in Turkey. According to the NUTS regions in Turkey which take part in PISA 2009 study the percentages and numbers of the students were as follows; Istanbul Region 800 (16.0%), Western Marmara Region 244 (4.9%), Aegean Region 620 (12.4%), Eastern Marmara Region 525 (10.5%), Western Anatolia Region 481 (9.6%), Mediterranean Region 637 (14.8%), Central Anatolia Region 296 (5.9), Western Black Sea Region 375 (7.5%), Eastern Black Sea Region 216 (4.3%), North Eastern Anatolia Region 142 (3.8%), Central Eastern Anatolia Region 218 (4.4%), South Eastern Anatolia Region 442 (8.8%), [total 4996, 100%].

RESULTS

Access to ICT Resources at School and at Home

Access to a Computer at School

In many countries school plays a crucial role in providing equitable access to ICTs (Thomson & De Bortoli, 2007). Table 1 presents the regional disparities in access to a computer at school for the twelve NUTS regions in Turkey. As can be seen in Table 1, access to a computer at school in Turkey (49.1%) is still very low. Overall, 49.1 per cent of students from Turkey have access to a computer at school; this range from 38.0 per cent in Mediterranean Region to 72.5 per cent in North Eastern Anatolia Region. Students from North Eastern Anatolia Region, Western Marmara Region, Central Eastern Anatolia Region reported the highest proportion of students accessing to a computer at school, quite above Turkey's average and students from Eastern Marmara Region, Western Black Sea Region, Central Anatolia Region and Aegean Region reported reasonable accessing to a computer at school, slightly above Turkey's average. In Istanbul Region, Eastern Black Sea Region and Western Anatolia Region less than 50 per cent of the students indicated accessing to a computer at school, slightly below Turkey's average. However, results showed that the lowest access with approximately 40 per cent of the students from Mediterranean Region and South Eastern Anatolia Region had access to a computer at school, quite below Turkey's average.

Table 1. Students' from Turkey access to a computer at school

The NUTS regions in Turkey	School (%)	Home (%)
Istanbul Region	46.6	73.4
Western Marmara Region	65.6	63.1
Aegean Region	50.5	63.4
Eastern Marmara Region	54.7	63.8

Western Anatolia Region	44.9	65.9
Mediterranean Region	38.0	40.2
Central Anatolia Region	51.0	47.6
Western Black Sea Region	54.7	49.6
Eastern Black Sea Region	45.4	44.9
North Eastern Anatolia Region	72.5	35.9
Central Eastern Anatolia Region	61.5	31.7
South Eastern Anatolia Region	38.5	28.7
Turkey's average	49.1	54.3

Access to a Computer at Home

Almost all of the Turkish PISA 2009 students showed they had less access to a computer at home. Overall, 54.3 per cent of students from Turkey had access to a computer at home; this ranged from 28.7 per cent in South Eastern Anatolia Region to 73.4 per cent in Istanbul Region (Table 1). Students from Istanbul Region, Western Anatolia Region, Eastern Marmara Region, Aegean Region and Western Marmara Region reported the highest proportion of students accessing to a computer at home, quite above Turkey's average. However, in Western Black Sea Region, Central Anatolia Region and Mediterranean Region less than 50 per cent of the students indicated accessing to a computer at home, slightly below Turkey's average and results indicated that the lowest access with approximately 30 per cent of the students from South Eastern Anatolia Region, Central Eastern Anatolia Region and North Eastern Anatolia Region had access to a computer at home, quite below Turkey's average.

These percentages implied that students from Istanbul Region, Aegean Region, Eastern Marmara Region, Western Anatolia Region and Mediterranean Region had less access to a computer at school than at home, and students from Western Marmara Region, Central Anatolia Region, Western Black Sea Region, Eastern Black Sea Region, North Eastern Anatolia Region, Central Eastern Anatolia Region and South Eastern Anatolia Region had more access to a computer at school than at home. All in all, students from Turkey had less access to a computer at school than at home.

Access to the Internet at School

Table 2 indicated that similar regional disparities were evident for access to the internet at school for the twelve NUTS regions in Turkey. Link to the internet at school in Turkey (44.4%) is still low-level. Overall, 44.4 per cent of students from Turkey also had access to the internet at school; North Eastern Anatolia Region had the highest percentage of students with access: over 70% of students in North Eastern Anatolia Region reported accessing to the internet in their school. In contrast, only about 30% of students in South Eastern Anatolia and Mediterranean Regions had access to the internet at school. Students from Central Eastern Anatolia Region, Western Marmara Region, Western Black Sea Region had an internet connection at home, quite above Turkey's average, and in Aegean Region, Eastern Marmara Region and Central Anatolia Region, less than 50 per cent of the students indicated accessing to internet at school, slightly above Turkey's average. But, in Istanbul Region and Western Anatolia Region less than 40 per cent of the students indicated a link to the internet at school. This was lower than the Turkey's average.

Table 2. Students' from Turkey access to the internet at school

The NUTS regions in Turkey	School (%)	Home (%)
Istanbul Region	39.4	74.0
Western Marmara Region	57.0	61.5
Aegean Region	49.8	60.3
Eastern Marmara Region	49.1	60.6
Western Anatolia Region	39.7	60.3
Mediterranean Region	33.3	40.0
Central Anatolia Region	47.0	43.2
Western Black Sea Region	53.9	48.5
Eastern Black Sea Region	44.0	44.9
North Eastern Anatolia Region	72.5	31.0
Central Eastern Anatolia Region	58.3	27.1
South Eastern Anatolia Region	29.4	26.9
Turkey's average	44.4	52.2

Access to the Internet at Home

Table 2 showed that that there were regional disparities in link to the internet at home. Overall, 52.2 per cent of students from Turkey also had link to the internet at home; in Istanbul region nearly 75% of students had link to internet at home, whereas the average was lower amongst the South Eastern Anatolia Region, and lower still – about 30% – in Central Eastern Anatolia Region and North Eastern Anatolia Region. About this percentage is still half that of Western Anatolia Region, Aegean Region, Eastern Marmara Region and Western Marmara Region. Students from Istanbul Region, Western Anatolia Region, Eastern Marmara Region, Aegean Region and Western Marmara Region reported the highest proportion of students accessing to the internet at home, quite above Turkey's average. But, in Western Black Sea Region, Eastern Black Sea Region, Central Anatolia Region and Mediterranean Region less than 50 per cent of the students indicated a link to the internet at school. This was lower than the Turkey's average.

These findings showed that students from Istanbul Region, Western Marmara Region, Aegean Region, Eastern Marmara Region, Western Anatolia Region, Mediterranean Region and Eastern Black Sea Region had less access to the internet at school than at home, and students from Central Anatolia Region, Western Black Sea Region, Eastern Black Sea Region, North Eastern Anatolia Region, Central Eastern Anatolia Region and South Eastern Anatolia Region had more link to the internet at school than at home. All in all, students from Turkey had less link to the internet at school than at home.

DISCUSSION

The purpose of this study was to examine the extent to which students from Turkey have access to ICT resources at school and at home, and differences in ICT accessibility by geographic region based on the data obtained from the PISA 2009.

Results indicated that:

i) 49.1 per cent of students from Turkey overall reported having access to a computer at school, and 38.0 per cent in Mediterranean Region to 72.5 per cent in North Eastern Anatolia Region;
ii) 44.4 per cent of students from Turkey overall reported having link to the internet at school, and 29.4 per cent in South Eastern Anatolia Region to 72.5 per cent in North Eastern Anatolia Region;
iii) 54.3 per cent of students from Turkey overall reported having access to a computer at home, and this ranged from 28.7 per cent in South Eastern Anatolia Region to 73.4 per cent in Istanbul Region;
iv) 52.2 per cent of students from Turkey overall reported having link to the internet at home, and this ranged from 26.9 per cent in South Eastern Anatolia Region to 74 per cent in Istanbul Region;
v) The access to a computer and the internet at school was highest in the North Eastern Anatolia Region and lowest in Mediterranean Region;
vi) The access to a computer and the internet at home was highest in the Istanbul region and lowest in South Eastern Anatolia Region;
vii) All in all, students from Turkey had less access to a computer at school than at home. Similarly, students from Turkey had less access to the internet at school than at home.
viii) Western Anatolia is the best region. The region is above the average of country in the ICT resources;
ix) South Eastern Anatolia is the worst region. The region is below the average of country in the ICT resources.

This finding supported the findings of previous studies (e.g., Gök, 2004; Koçberber & Kazancık, 2010; Sarıer, 2010) which revealed that the South Eastern Anatolia region was below the average of country in the educational opportunities, in particular, in terms of educational investments. This result is consistent with Koçberber and Kazancık's (2010) study which indicated that Western Anatolia is the best region in all the educational indicators. Access to a computer at school and at home in Turkey is still very low. Similarly, link to the internet at school and at home in Turkey is still very low too. At this point students from Turkey are still among the world's digital poor. Students in developing countries such as Tunisia, Turkey, Philippines and Mexico had the highest proportion of students who had not access to a computer and the internet at school and at home (Rodrigo, 2005; Thomson & De Bortoli, 2007). Result showed that students from Turkey can not access and link to ICT resources to the same extent as their international counterparts and Turkey has inter-regional differences in terms of ICT resources. These findings confirm that medium human development countries in general tend to have limited computer and the internet access at school and at home, and students from developing countries can not participate fully in the digital world (Rodrigo, 2005; Thomson & De Bortoli, 2007).

CONCLUSION

Nowadays, although information and communication technology is used a lot in every field, the results of PISA 2009 show that in Turkey, access to a computer and link to the internet at school and at home is still too low. These findings imply that information and communication technology (ICT) in Turkey is not completely integrated into learning environment and students' life. The under use of ICT in education and in home may be arisen from illiteracy, inequality, low levels of living, low productivity, poverty (Kessy, Kaemba, & Gachoka, 2006) and inter-regional differences. In conclusion, these results also provide potential insights for the conduct of the future research.

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THE INVESTIGATION OF CYBER BULLYING LEVEL OF TEACHER CANDIDATES IN RELATION TO SEVERAL VARIABLES

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The purpose of this study is to determine the level of cyber-bullying experiences of teacher candidates. Differences in cyber bullying according to gender, frequency and skill of internet use, social relation problem are investigated. The sample of study is 253 first grade teacher candidates from different department in Education Faculty in Ahi Evran University. As a data collection instrument, Cyber Bullying Scale was developed by Erdur-Baker and Kavşut (2007) and revised by Topçu (2008) and personal information form was used in this study. In the analysis of the data, mean, t-test and one-way analysis of variance (ANOVA) was used. According to the results of the study, there were significant differences between students'cyber bullying in terms of gender, frequency of internet usage and skill of internet use. However, there was no significant difference between students' cyber bullying in terms of social relation problems.

Keywords: Cyber bullying, teacher candidates

INTRODUCTION

The use of the Internet and the mobile phones has recently increased. The number of people using computers and the Internet is constantly increasing. The "Information and Communication Technology (ICT) Usage Survey in Households and Individuals" (TÜİK, 2010) which was carried out by Turkish Statistical Institute (TÜİK) indicated that the use of computers and the Internet has recently increased. According to the results of ICT Usage Survey in Households and Individuals carried out in April 2010 by TÜİK, the proportion of households with Internet access is 41, 6%. Moreover, the proportions of the male that use computer and Internet were 53, 4% and 51, 8 and these proportions were 33, 2% and 31, 7% for female, respectively in 16-74 age groups. These proportions were 50, 5% and 48, 6% for males and 30,0% and 28,0% for females in the same period of the previous year. People might be engaged in many Internet-based activities like gaming, searching for interest, communicating with their friends. The increase in access to the technologies in education might also increase the student's social interaction and collaborative learning experiences.

In addition to this, the emergence of e-communication into the classrooms brought some problems with it that we should take into account. One of these problems is cyber bullying which is defined as giving harm to others using e-communication tools. With the emergence of information and communication technologies (ICT) which have an important role on interaction and the life of the individuals, there has been a shift from physical bullying to the cyber one and this shift required the scientist to broaden their definition of bullying to the unlimited digital world (Akbulut, Şahin and Eristi, 2010).

Li (2008) defined cyber bullying as the bullying with e-communication tools like e-mail, mobile phones, PDS, instant messaging and World Wide Web. Willard (2005) defined cyber bullying as sending harmful materials using the Internet and other digital technologies or being rude to others using the other types of social aggressiveness. Cyber bullying was also defined by Smith, Mandav, Carvalho and Tippett (2005) as the use of electronic-based communication tools by an individual or a group of people towards the undefended victim on purpose and repeatedly. A more specific definition made by Patchin and Hinduja (2006b) was disturbing someone sending offending and harmful messages through internet-based communication tools. The common point of these definitions is the use of the Internet-based communication tools for bullying. Cyber bullying include sending e-mail messages or instant messages

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including damage and threat, publishing insulting content for someone on web sites and frightening or threatening someone in online environment (Hinduja and Patchin, 2007).

Before preventing this problem, we should clearly understand what it is. In studies carried out for this purpose, it was aimed at determining the concepts related to the cyber bullying. In these studies, it was investigated whether the level of cyber bullying changes according to some variables like gender (Li, 2007 Smith and et al., 2005), socio-economic status (Erdur-Baker, 2007), the frequency of using information technologies (Li, 2006; Erdur-Baker, 2007). As the frequency of using information technologies did not cause any change in cyber bullying, it was considered that some variables like the period of using Internet, the skill for Internet usage might cause cyber bullying.

In the light of these, the purpose of this study is to determine the level of teacher candidates to become a cyber bully. Taking that the age group which use the information technologies most is 16-24 age period (TÜİK, 2010) into account, the level of teacher candidates who spend time on the Internet for different purposes to become a cyber bully was investigated in terms of different variables.

Problem Statements: What is the level of cyber bullying of teacher candidates?

Research Questions:

1. Is there any significant difference between cyber bullying and their gender in teacher candidates?
2. Is there any significant difference between cyber bullying and their daily internet usage in teacher candidates?
3. Is there any significant difference between cyber bullying and their skills of internet use in teacher candidates?
4. Is there any significant difference between cyber bullying and problems of social relations in teacher candidates?

METHOD

Research Method: Survey method was used in this study. The purpose of this study is to determine level of cyber bullying of teacher candidates.

Sample: The sample of study is 253 first grade teacher candidates from different department in Education Faculty in Ahi Evran University. Distribution of sample according to the department is shown in Table 1.

Table 1. Distribution of sample according to the department

Department	Total
CEIT	43
PCG	44
Elementary Mathematics Education	33
Early Childhood Education	29
Primary School Education	78
Social Studies Education	26
Total	253

Data Collection Instruments: As a data collection instrument, Cyber Bullying Scale which was developed by Erdur-Baker and Kavşut (2007) and revised by Topçu (2008) and personal information form was used in this study. The participants were asked to report their experiences on four-point Likert type items (never, once, twice or three times, three times and more) providing scores for being a cyberbully in cyber bullying scale. Questions were asked to students about gender, daily internet usage, skill of internet use and problems of social relations in personal information form.

Data Analyses: The data was analyzed through SPSS. Mean, t-test and one way analysis of variance (ANOVA) were conducted in order to statistically analyze the obtained data.

FINDINGS

The distribution of normality of scores is examined and it was found that scores of cyber bullying have a positive skewness. If you have a positive skewness between scores, "logarithmic transformation" is done (Büyüköztürk, 2007). Therefore, “logarithmic transformation" was performed on scores of cyber-bullying in order to normalization.

In this section, descriptive statistics analyses of cyber bullying score of teacher candidates are given. Result of analysis is shown in Table 2.

Table 2. Descriptive statistics of students’ cyberbullying score

	N	$\overline{X}$	Min	Max	SD
Cyberbullying	**248**	**1,20**	0,70	1,70	0,11

According to results of descriptive statistics, teacher candidates’ cyberbullying level is low.

Findings about cyber bullying and gender

The first sub-problem of this research is defined as “Is there any significant difference between cyberbullying and their gender in teacher candidates? “ T-test was applied to determine whether there are statistically meaningful changes on the cyber bullying level according to gender. Result of analysis is shown in Table 3.

Table 3. T-test results of teacher candidates’ cyber bullying according to gender

Gender	N	$\overline{X}$	Sd	Sf	T	P
Male	171	1,19	0,1	246	-3,81	,000
Female	77	1,24	0,14			

*The mean difference is significant at the .01 level

Table 3 shows the findings concerning female and male students’ cyberbullying. The findings showed that female and male students received differing score averages from cyberbullying scale. It is evident from Table 3 that female students received higher averages than male students. A significant difference was found in term of gender ($p<0.01$). According to this result female students have higher cyberbullying than male students.

Findings about cyber bullying and daily internet usage

The second sub-problem of this research is defined as “Is there any significant difference between cyberbullying and their daily internet usage in teacher candidates?” Primarily mean values of cyber bullying score according to skill of internet use is presented in Table 4.

Table 4. Mean values of cyber bullying score according to daily internet usage

Daily internet usage	N	$\overline{X}$	Df
Less 1 hour	125	1,17	0,09
1-4 hours	93	1,22	0,12
4 hours and more	25	1,23	0,16
Total	243	1,20	0,11

When Table 4 is examined, teacher candidates who use internet more 4 hours in a day have highest mean score ($\overline{X}$=1,23) and teacher candidates who use internet fewer than 1 hour in a day have lowest mean score ($\overline{X}$=1,17) One way variance analyses (ANOVA) was applied to determine whether there are statistically meaningful changes on the cyber bullying level according to daily internet usage. Result of analysis is shown in Table 5.

Table 5: ANOVA results of teacher candidates’ cyber bullying according to the daily internet usage

	Sum of Squares	Df	Mean Square	F	P	Meaningful difference
Between groups	0,169	2	0,71	6,906	,001	1-2 1-3
Within groups	2,938	240	0,12			
Total	**3,107**	**242**				

*The mean difference is significant at the .01 level

1: less 1 hour, 2: 1-4 hours, 3: more 4 hours

It is evident from Table 5, According to the results obtained from one-way variance analysis, there is a significant difference between cyber bullying and daily internet usage (F=6,906, p<0.01).

The Bonferroni test was applied to the data to be able to determine the groups that causes statistically meaningful difference in the cyber bullying of teacher candidates. As a result of the Bonferroni test, it is determined that this meaningful difference arise from students that express a daily internet usage duration of "less 1 hour" with "1-3 hours" and "4 hours and more"

Cyber bullying of daily internet usage of "less than 1 hour" is significantly lower than daily internet usage of "1-4 hours" and "more 4 hours". In similar way, there is a significant difference between "1-4 hours" and "less than 1 hour". Lastly there is a significant difference between "more 4 hours" and less 1" hour". In this situation, it was determined while the daily internet usage is increasing, the cyber bullying increases in positively.

Findings about cyber bullying and skills of internet use

The third sub-problem of this research is defined as "Is there any significant difference between cyberbullying and their skill of internet use in teacher candidates?" Primarily mean values of cyber bullying score according to skill of internet use is presented in Table 6.

Table 6. Mean values of cyber bullying score according to skill of internet use

skill of internet use	N	$\overline{X}$	Sd
Amateur	34	1,18	0,06
Medium	153	1,19	0,10
Advanced	60	1,25	0,14
Total	247	1,20	0,11

When Table 6 is examined teacher candidates whose skill of internet use defined as "advanced" have highest mean score ($\overline{X}$=1,25) and teacher candidates whose skill of internet use defined as "amateur", have lowest mean score ($\overline{X}$=1,18). One way variance analyses (ANOVA) was applied to determine whether there are statistically meaningful changes on the cyber bullying level according to skills of internet use. Result of analysis is shown in Table 7.

Table 7. ANOVA results of teacher candidates' cyber bullying according to the skills of internet use

	Sum of Squares	**Df**	**Mean Square**	**F**	**P**	**Meaningful difference**
Between groups	0,20	2	0,100	8,314	,000	1-3 2-3
Within groups	2,947	244	0,012			
Total	**3,148**	**246**				

*The mean difference is significant at the .01 level

1: amotor, 2: medium, 3: advanced

It is evident from Table 7, According to the results obtained from one-way variance analysis, there is a significant difference between cyber bullying and skill of internet use (F=8,314, p<0.01).

The Bonferroni test was applied to the data to be able to determine the groups that causes statistically meaningful difference in the cyber bullying of teacher candidates. As a result of the Bonferroni test, skill of internet use defined as "advanced" whose scores of cyber bullying significantly higher than "beginner" and "medium". In this situation, it was determined while the skill of internet use is increasing, the cyber bullying increases in positively.

Findings about cyber bullying and problems of social relation

The fourth sub-problem of this research is defined as "Is there any significant difference between cyber bullying and problems of social relations in teacher candidates? One way variance analyses (ANOVA) was applied to determine whether there are statistically meaningful changes on the cyber bullying level according to problems of social relations. Result of analysis is shown in Table 8.

Table 8. ANOVA results of teacher candidates' cyber bullying according to problems of social relations

	Sum of Squares	**Df**	**Mean Square**	**F**	**P**
Between groups	0,019	3	0,06	,507	,678

Within groups	2,984	240	0,12
Total	**3,148**	**243**	

It is evident from Table 8, According to the results obtained from one-way variance analysis, there is no significant difference between cyber bullying and problems of social relations (F=, 507, p>0.01).

RESULTS

As a result, it was found that teacher candidates have a low level of cyber bullying. It is possible to say that teacher candidates avoid behaviors that harm others in the virtual environment

A significant difference was found in term of gender. According to this result female students have higher cyber bullying than male students. It is possible to say that female students have more cyber-bully behavior among teacher candidates. Results are supported by other studies. These studies reached similar conclusions: the level of female students' cyber bullying scores are higher than male students (Li, 2007; Smith and etc., 2005).

There is a significant difference between cyber bullying and daily internet usage. The teacher candidates who use internet less than 1 hour in a day have lower cyber bullying level than those who use 1-4 hours and more 4 hours in a day. In this situation, it is possible to say that while the daily internet usage is increasing, the cyber bullying increases in positively. This finding is similar to Erdur-Baker's (2009) study which investigated adolescent's cyber bullying experience and Ybarra's (2004) study. Ybarra (2004) found that the amount of internet use is important predictor for the experience of cyber bullying. Patchin and Hinduja (2006) came to a similar conclusion: youth who participated in more activities online were more likely to experience online bullying. The result of this study was supported by the results of Erdur-Baker and Çapa-Aydin's (2008) study. Topçu, Erdur-Baker and Çapa-Aydin (2008) found that usage frequency of online communication tools was a significant predictor of cyber bullying

There is a significant difference between cyber bullying and skill of internet use. Skill of internet use defined as "advanced" whose scores of cyber bullying significantly higher than "beginner" and "medium". The findings of Vandebosch and Katrien's (2009) study differ from finding of this study. Vandebosch and Katrien (2009) found that advanced internet skills were not significant predictors of bullying.

There is no significant difference between students' cyber bullying score and problems of social relations Vandebosch and Katrien (2009) came to a similar conclusion: social competence was not significant predictors of bullying. The results of this study are similar to Vandebosch and Katrien's (2009) study.

SUGGESTIONS

Variables such as cyber bullying and skill of internet use measured as self reported. Future research should use other methods, such as those involving focus groups, in-depth interviews, and observations. Various types and sources of data would be helpful in gaining a more comprehensive view on the phenomenon.

Whether or not there is a significant difference between cyber bullying scores in term of internet use areas should investigate in further.

Future research, teacher candidates' levels of exposure to cyber-bully behavior and what variables affect levels of exposure to cyber-bully behavior can be investigate.

And predictor variables of level of cyber bullying of students can be investigate. Psychological conditions of cyber bullying should receive serious attention in future studies.

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THE NEW GENERATION OF LEARNERS AND THE ORGANIZATIONAL AND EDUCATIONAL CHALLENGES IN HIGHER EDUCATION

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ABSTRACT

Educators are facing the challenge of adjusting their teaching practices and styles to accommodate a new generation of learners. The Net Generation, Millennial, Generation Y or New Generation of Learners, who are now entering universities, have learning styles, expectations and needs different from previous generations. This paper addresses some particular characteristics of this new generation and the challenges that faculty has to cope with to accommodate a generation digitally literate, demanding for practical and appealing learning, feeling confortable interacting through social networks, and expecting immediate responses and connectivity, as well as the educational challenges to accommodate their learning needs. Finally, some thoughts are in place about the responsibilities that faculty and universities need to face because of this generation's learning preferences.

Keywords: ICT in education, Net Generation, Millennial, Generation Y, New Generation of Learners

I. INTRODUCTION

Today's help calls for any type of support through an 800 number can be diverted to any part of the world. Indeed, many world firms are outsourcing their technical support departments to other locations of the planet. The borders of the world are more than ever blurring, as the internet brings us all a few keystrokes away from the service we need.

Higher education on the other hand, is facing many new demands and is challenged with decreasing funding from all supporting sources. There are increasing requests for accountability from a variety of communities, both inside and outside of the academy. There are demands for curriculum revisions to graduate learners with the necessary skills to meet changing workforce needs. There are mandates to meet requirements for appropriate information technologies infrastructure, for new faculty coming in at universities as well as for an aging faculty. Issues and challenges aggregated with a new and unique population of learners are converging upon higher education institutions.

To understand this unique population of learners and their challenges, it is important to know the age groups on the time period in which they were born. Oblinger & Oblinger [18, 19] discussed a classification system that describes various generations as Matures (1900-1946), Boomers (1946-1964), Generation X (1965-1982); and Net Generation (1982-1991), New Learners, Millennials or Generation Y as called by others. This classification intersects in time periods with other classifications. Howe and Strauss [10] classified the generations as: Boomers (1943-1960), Generation X (1961-1981) and Millennials (1982-present). In most instances in Ecuador, faculty are primarily Matures or Boomers. However, the student population crosses all generations with the newest, the Net, Millennial, Y or New Generation of Learners, being distinctly different in their characteristics and learning expectations.

The digital revolution significantly influenced the children born after 1981; Generation X practically started using information technologies when adults. Children from this generation were shaped mostly by TV, and Video Games, while Generation Y came during the digital revolution embracing information technologies and shaped by the Personal Computer, Computer Games and the WWW.

The effect of information technologies in the New Generation of Learners is particularly strong as we consider their profound effect in higher education. Information technologies have become so pervasive on university campuses that it is hard for faculty not to include them in the instructional process. Even more, in our developing countries, our universities must deal with an ever growing demand for infrastructure to support student's personal technologies, such as wireless laptops, smart phones or PDAs.

Much has been written about this new generation, but who are they and how do they differ from the past generations? Referred to Sue Bennett, Karl Maton and Lisa Kervin [1], who have written an extended review describing the characteristics of the Net Generation.

Marc Prensky [21] used the qualities of the digital natives and the digital immigrants to differentiate students in the past from the students of today. Digital natives grew up with technology; they live in a digital world. Digital immigrants view technology as an innovation and grew up in an analogue world. A good example to distinguish between the two is to see how people find information about a particular service or where to buy a particular item. The digital immigrant looks at the "yellow pages", while the digital native "googles" the information on the Internet. As digital immigrants, most faculty and staff are still working to adapt to this new way of doing, thinking, communicating, socializing, teaching and learning.

The purpose of this article is to highlight some important characteristics of the New Generation of Learners and their impact on higher education as they challenge the teaching-learning paradigm; looking from the perspective of their preferences as digitally literate, demanding for practical and appealing learning, feeling confortable interacting through social networks, and expecting immediate responses and connectivity, as well as the educational challenges to accommodate their learning needs.

II. THE NEW GENERATION OF LEARNERS

The New Generation of Learners, Net, Millennials or Generation Y, has unique characteristics that differentiate them from other generations. Several authors (Brown [2]; Frand [7]; Howe & Strauss [10]; Merritt [14]; Oblinger [18]; Skiba [27]) have written about the characteristics of this generation. These unique characteristics are challenging the traditional classroom teaching structure, and faculty are realizing that traditional classroom teaching is no longer effective with these students.

These characteristics include [27]: The sense of *authentication and trust*, because people from this generation, as knowledgeable individuals about information technologies, need to verify, check resources and authenticate people. They are *emotional and intellectually open*, because the openness of the online environment and anonymity are considered the most important assets of this generation, as well as the freedom for *exploration, discovery, and curiosity*. Their sense of autonomy stems from the experiences of being an *active information seeker and creator of information*. Having access to information at their fingertips, this generation is active and confident with *strong views and freedom for expressing themselves*. One of the most visible characteristics is the *immediacy*; this generation views the world as 24x7x365 and demands real time and fast processing. *Diversity and inclusion* are also characteristics of this generation, which views the world in a global context.

Important to mention is *innovation*; this group likes customization and wants to have options and try before buying, and have fascination for new technologies. They are constantly trying to push the technology to its next level and figure out how to create a better world.

Considering these characteristics, this new generation of learners, demands for new learning settings. The traditional teaching has emphasized the acquisition of facts and it was a content-focused learning. Faculty from previous generations is mainly text-based, with emphasis in memorization, repetition, and recall. The New Generation is digitally literate, demanding practical and appealing learning, feeling confortable interacting through social networks, and expecting immediate responses and ubiquitous connectivity.

The New Generation of Learners grew up and is comfortable in a digital world; where more important is what the technology enables them to do, than the particular technology. As part of this digital literacy, this generation is both information and multimedia literate. "They are more comfortable with an image-rich environment than with text" [19]. It is important to note that this generation seeks immediate information not by finding it in a textbook, but by connecting to the Internet.

The New Generation of Learners wants to construct their knowledge. Learning is not done in isolation and they learn cooperating with others. According to Frand [16], this is the Nintendo Generation and "…the key to winning Nintendo is the persistent trial and error to discover the hidden doors". Visualizations, simulations, case analyses, and other methods of participatory learning such as fieldwork are all part of this scenario.

"The TTT (talk, text, test) approach", is not valued by the New Generation of Learners [19]. TTT represents the traditional teaching paradigm of lecturing, asking students to read text, and giving a test to

insure they have recall and acquisition of facts. This generation promotes social interactions, reinforcing their use of instant messaging, blogging, gaming, and their large global network of contacts.

The New Generation of Learners has little tolerance for delays. They expect instant access and responses as they live in a 24x7x365 world. Emailing is from the past, when they can instant message someone immediately. This generation is also multitask, and mobile nomads who are always connected through cell phones, wireless devices, or laptops; use short hand symbols to communicate, usually not familiar to the digital immigrant population.

The social aspects of the new technologies and the services they facilitate should not be underestimated as powerful tools for exchange of knowledge, ideas and experience between students, professionals and researchers. There are many examples of blogs that became research and professional forums, even virtual places for workshops and conferences.

III. EDUCATIONAL CHALLENGES

The above mentioned characteristics are imposing some interesting challenges to faculty, concerning not only their teaching practices, but also their relationships with students, which need to be revised to accommodate the New Generation learning needs.

The recent developed "social technologies" empowered by wireless connectivity, generally omnipresent, have enriched the informal learning process that commonly occurs outside the classroom. At present, the learning process for the New Generation of Learners occurs in two settings: Formally, at the University, where they go to get credentials and the formality of teaching occurs, and; informally, outside the University, where they are fully involved in their social networks and personal virtual spaces, sharing and communicating through instant messaging.

As digitally literate, to facilitate learning to this New Generation of Learners, wired classrooms are a must. The lecture format is not the kind of setting they preferred, it is important to take advantage of their multitasking ability by posting relevant internet links, course materials and notes, hence students can explore relevant and interesting resources and become engaged with the course. Learning facilitators should not rely solely on Internet search engines, but direct students to specific databases and relevant specialized sites.

Today's university courses usually are complemented with class materials, notes, slides, webliography and other rich multimedia materials, available through learning management systems (LMS); although, this is relevant to the new generation of learners, web-based components need to engage students to motivate interaction, and not just a static web page dispensing content.

Since the New Generation of Learners lives in a mobile world which facilitates their multitasking nature, pod-multi-ip-casting important lectures will engage students to listen to these lectures on their smart phones, wireless and other MP devices.

Demanding for practical and appealing learning needs to be addressed, the use of simulation technologies will help engage learners in a process that provides the interaction they desire with the feedback they need in real-time situations. Through the design of pertinent scenarios, faculty can direct learning in a way that facilitates student understanding of subtle changes in reality. This might help prepare this New Generation of Learners transition to the work force.

Blogging has become a popular way to express opinions and it is a method that allows students to interact and get engaged in course discussions. Interactive LMSs with appealing web environment will allow learners to interact not only with the instructor, but with other learners and with the content. Learners can research and look for information and provide their reflections on the learning process through the blog.

Feeling comfortable interacting through social networks, this generation facilitates the implementation of creative teaching strategies in the area of collaborative learning. While previous generations have consistently worked backwards to the concept of "group work," [7, 8], this generation relays on collaborative learning in both face-to-face and virtual venues. For example, SIDWeb, the LMS used in ESPOL University, provides collaborative workspaces, where learners interact through chat rooms, audio, or video conferencing. Learners can store documents and schedule synchronous meetings over the Internet. The collaborative concept facilitates partnership and sharing while requiring students to be active participants in the learning process.

Through interactive response devices professors can foster interaction within the classroom environment, creating long-lasting learning experiences by asking learners to use these devices to select responses to questions, thus interacting with the content. Responses can then be automatically displayed for all in the class to see or used as a resource for discussion and reflection.

Current LMS struggle to catch and hold the attention of New Generation of Learners; these environments place the learner in a passive role of static content recipient. This generation expects to be connected, actively interacting and collaborating with their contact community, in a personalized learning environment, that they helped to build and unrestricted managed by them.

For the New Generation of Learners, the notion of collaboratively construct knowledge within a social community is very appealing [26]. Professors need to increase the use of websites that allow users to add content, such as Internet forums, allowing anyone to contribute to enrich course materials and notes.

The immediate response and connectivity expectations of this generation of learners are challenges that digital immigrant faculty needs to overcome. While email is used regularly for communication, deferred responses do not fit within "instant messaging". It is important for faculty members to communicate with students up front so they know when they can expect to receive feedback.

IV. FINAL CONSIDERATIONS

The challenge for universities increases as the gap between institutional information technologies and the technology environments, the New Generation of Learners has created for themselves, grows. Today's students are avid users of the Web, e-mail and a variety of other information resources; however, their rapid adoption of cell phones for instant messaging and social networking through collaborative resources, which generally are not part of campus infrastructures, leads to a whole new set of concerns.

It is fact; the New Generation of Learners has arrived in our higher education institutions. Faculty must know and understand these learners and their expectations. Universities must rethink the classroom setting, and faculty needs to adapt their teaching practices and consider various strategies to accommodate the learning needs of this generation, as well as be open to adapting their teaching methods.

There is no uncertainty; this new generation of students is challenging the traditional teaching practices in higher education. It is important to conceive learning activities that line up with the learning styles and expectations of the New Generation of Learners. For the faculty, the challenge includes knowing the students and their preferences and how to adapt to those preferences, as well as how to engage learners to the learning process, while adapting teaching practices by incorporating information technologies. The university needs to define an appropriate balance between the activities performed face-to-face within the classroom and those within the virtual worlds of learning, and to balance between faculty and student perspectives.

Students not only need to developed basic skills for handling information technologies to facilitate their learning, but the educators must keep pace with the learners. Professors must be aware of the learning preferences of this generation and develop course curriculum based on current materials to meet their learning needs, stimulating their interest for science, creativity and exploratory learning, developing their critical thinking and persistence.

And this is just the beginning, because Generation Z, the age group born after 1993, is now arriving to the universities. If we consider Generation X as the younger part of the current academic staff, they will be the ones engaging Generation Z, how prepared are we and our Institutions to cope with this challenge?.

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THE POLITICS OF BLACK HAIR IN EDUCATIONAL TECHNOLOGY

INTRODUCTION

Donna Kakonge

I started doing research on the politics of black hair back in 1998 at Concordia University in Montréal. I developed an online virtual salon called Salon Utopia, as well as wrote a 90-page thesis paper called Afro Forever. Salon Utopia and Afro Forever was peer reviewed and evaluated by Dr. Martin Allor, Dr. Lorna Roth and Dr. Kim Sawchuk.

In 2006, Afro Forever was reformatted and was self-published under Lulu.com under the title of What Happened to the Afro? I applied to York University, Ryerson University and four times to OISE/University of Toronto until I finally proposed the idea of continuing this research and my current advisor is Dr. Stephanie Springgay at OISE to do my PhD in Curriculum, Teaching and Learning Development.

I started my PhD in May 2010 and completed an online course in Foundations of Curriculum with Dr. Heather Sykes. I was highly impressed with the organization of this course and have adapted some of its models as I built the curriculum for The Politics of Black Hair Online Course that started July 19, 2010 and ended August 29, 2010. The summary of the course is as follows after the literature review.

Part of the exploration of my research is to answer the question, since African women of the diaspora spend the most money on their hair (Rock, 2009), why are they not being taught the skills in post-secondary education to own the means of production to their personal choice of hair transformation? Young black women who can articulate themselves in either Patois for those of Caribbean heritage, English for those of former British colonies and French for those of former French colonies explain their experiences of going through body and hair modifications in order to prepare for their educational experiences. A huge influence on these body and hair modifications include the power of songs such as Prince's (1984) "The Beautiful Ones," as well to a lesser extent meditation-inspired music such as Gregorian chants. The methodology used includes a case study building on online qualitative research.

My own currere in getting ready for school and buying into the beauty culture began with the assistance of my wonderful mother. She did her best to make me "presentable" (as my Mom would say) for school. She would sit me down each night before school would start in the morning and braid my hair mostly into two simple braids on each side of my head. I would then cover these braids with a scarf so the style would look fresh for school. She would do the same for my sister.

When I turned nine, I was heavily influenced by the power and importance of musical artists such as Michael Jackson and Prince. To this day, the only poster of a musical artist whom I have had on my bedroom wall is that of Michael Jackson. I begged my mother to let me get a Jheri curl, and eventually she allowed me to do so. This began my personal body/hair modification to fit into the codes of passing that I was educated about through the media. However, just as I was educated to "pass," I was also being educated to be a passive receiver of these media messages, rather than an active agent in the means of distribution that heavily occupy the finances of so many women from the African diaspora.

In 2003, I was in a province-wide public service announcement (PSA) for the Ministry of Health and Long-Term care. In this PSA which promoted the Ministry's Tele-Health service across Ontario, I wore a long black straight wig (bought by me) and tons of L'Oreal makeup (bought by me). I was taking acting classes at George Brown College at the time and how I was identified in the PSA as "Donna – Student." I had achieved what my white producers of the PSA wanted, I had become the "Beautiful One," I had passed through the lens of the white eye.

Passing, authenticity and the power of the white gaze all started with the first encounter of Africans with Europeans before the slave ships came to North America. In Willie Morrow's (1973) book and movie 400 Years Without a Comb, Morrow explains how white people saw black people as a source of labour to build America. In the film, once black people came to the Americas, there is a scene in which the white slave owners stare at the Africans, commenting on how their skin is so "black" and their hair is like "wool." The

white slave owners would tentatively touch the Africans. Later in the movie, Morrow (1973) explains how Africans, once put into bondage and used as labour, would start to develop what he calls "the inferior seed." Black people started to emulate the look of whites by pressing their hair with irons, even covering their hair to keep it out of site from their white masters. Some slaves would also use the washing bleach to whiten their skin and pinch the noses of the newly born African-Americans. It was a mother's duty to purse the lips of her baby to look more like their white slave owners. Although the rape of black women during slavery by their white masters was unwelcome, the result of a lighter-skinned mulatto child who would have an easier time in American society because they could pass was welcomed (Morrow, 1973).

Passing and authenticity is prevalent in courtrooms, classroom, media arts, and visual arts and even in technology now hundreds of years later. It all comes down to the power of the white gaze and the power whites have in a global society. In Looking White People in the Eye: Gender, Race and Culture in Courtrooms and Classrooms (Razack, 1998), Sherene Razack discusses the power of the white gaze in the classroom. Razack does not focus on media, but her arguments are powerful. Razack's points of view however are powerful at illustrating the meaning behind the white gaze, as well as the effect it has on non-whites. It is the power of the gaze that Razack discusses most non-white women present themselves as "culturally different." The notion of passing, via the straightening of hair for black women, puts black women in a position to surpass their cultural difference and to be accepted in the classroom. It is also important to discuss how the education affects racialized bodies in the media arts. This sets up the notion of the importance of passing versus authenticity in the educational realm.

hooks (2000) notes that many blacks have not seen the visual arts as important towards the black struggle because they have followed the ways of white folks. hooks (2000) notes that many black people are influenced by television and movie images. It is all part of the power of the white gaze. This is why I have painted a picture of a "Black Woman with Afro embodied by a Rose and Based in Water" (Kakonge, 2010). This painting is featured in my home in a location where my black gaze takes precedence, my bedroom wall. It is a literal illustration of taking back the power of the white gaze and how others may or may not view me. It is an authentic replication of self.

Much has been said and written about the racial stereotyping of blacks in the media, as well to the roles of skin colour and hair. Yet, look closely at the black women who play romantic leads in films: they nearly always have light skin and long hair. Light-skinned black women with classic European features also are predominate in beauty pageants, music videos, and the world of modeling (Russell, Wilson, and Hall, 1992; Craig, 2002).

For a brief period in the early seventies some of the same colour biases that affected the casting of black men were applied to very light-skinned black women. Debra Pratt, a writer, director, and actress, was told after one audition that she was inappropriate for the lead because it required a real black woman, and she did not really look black enough (Russell et. al., 1992).

More recently, light-skinned black actresses are always lighter than their black leading men. It is apparently an inviolate rule in Hollywood that black actresses: Appolonia in Purple Rain, Vanity in Action Jackson, Shari Headley in Coming to America, Cynda Williams in Mo' Better Blues, Halle Berry in Strictly Business and Lonette McKee in Jungle Fever are always lighter than their black leading men (Russell, et al., 1992). This trend continues to be true. Even in more recent movies such as How Stella Got Her Groove Back, Angela Bassett was lighter than her leading man, and in How Do Fools Fall in Love, leading women were lighter than the leading man. In the world of cultural studies/media studies and how that educates, the colour and hair biases persist.

In music videos, the image of the octoroon beauty have been resurrected. Rarely if ever are dark-skinned black women with Negroid features and natural hair depicted in rap videos. Instead, long-haired black women with Caucasian features strike provocative poses behind macho black male rap artists. According to the (Russell et. al, 1992), Harvard psychiatrist Alvin Poussaint commented that for those who are not aiming to pass, perhaps this is where the true power lies: talented black women rappers, like Queen Latifah [who has now gone mainstream], Sister Souljah, Bytches With Problems, and the folk rock singer Tracy Chapman are also challenging the prejudices of the media with their strongly ethnic looks and Afrocentric styles. This new wave of female musicians are letting audiences know that black women do not have to be light-skinned and delicate to be considered beautiful and sexy (Russell, et. al, 1992: 160). However, it grates on some black people's and non-black people's nerves like Gregorian chants due to its non-conformity.

Michele Wallace (1990) brings in a whole other element when looking at media education, race and passing. She also brings up the important element of commodity and the materialistic culture that we live in.

This links back to Peggy McIntosh's (1988) idea of a White knapsack of privilege. Where as Wallace (1990) so poignantly points out that television shows like The Cosby Show indicate how blacks can pass through the commodified culture we have. Moreover, what this tends to mean in terms of television and a show like the Cosby Show, for example, is that blacks are shown as characters who possess positive attributes of white culture, which are really the attributes of a hypothetical and impracticable absence (or commodification) of culture. Similarly, Prince with his purple dress (not black), and aspiring for the "Beautiful One" (1984), Appolonia, as also accepted and defined by a white power and dominant culture.

Culture is then reduced to a style of consumption that offers up, say, expensive, exotic-looking hand-knit sweaters, or a brief scene of the Cosbys at a jazz club where a black woman is singing, rather than any concrete or complex textualization of cultural difference. Indeed the show seems to suggest, in its occasional use of Asians and Latinos, as well as blacks, that no one is ultimately different, since culture is something you can buy at Bloomingdales, a kind of wardrobe or a form of entertainment (Wallace, 1990: 2).

Course Introduction:

As part of the content of the online course that was be powered through KickApps.com and will continue to be, plus via email, photographs will be part of the curriculum. I have taught in the Independent Digital Photography program at Seneca@York's School of Communication Arts. "Photographs make the dynamics of racism visible as well" (Castenell et al. 1993). Mariamne Watley analyzes images of black women that were meant to be positive, although negative connotations could be drawn. "Exotic," "sexually dangerous," and "asexual" were some of the impetrations that Watley came up with (Castenell et al. 1993). As well, as part of the online course, three pieces of literature were analyzed. Ralph Ellison's Invisible Man (1952), Toni Morrison's The Bluest Eye (1970) and the author of this dissertation, Donna Kakonge's My Roxanne (2007). The self-actualization that can be found through narrative is transformative (del Guadelupe et al. 2009). English literature was my minor at Carleton University and I have written 41 books. I have also taught and/or am teaching writing at Seneca College, Ryerson University, George Brown College, Humber College, University of Guelph-Humber and UTSC-Centennial College joint journalism program, as well as Centennial College itself. Among these writing programs I have taught at, I have also taught scriptwriting. I have taken scriptwriting courses with the late author/producer Toni Cade Bambara and also Mary MacKay-Smith who writes for children's television. The scripts that will be examined include Barbershop (2002), Barbershop II (2004), 'da Kink in My Hair (TV or play) (2006), Good Hair (2009), Hairspray (2007) and Hair (1979). A special focus will be placed on 'da Kink in My Hair (2006). A look at Third Wave Feminism and Television: Jane Puts it in a Box (Johnson 2007), nothing is mentioned about the presence of black third wave feminism in this book. On the other hand Astrid Henry (2004) discusses Cheryl Lynn's popular 1978 song "Got to be Real" in terms of not faking it – what can also be analyzed as keeping to one's extraordinary beauty as a black person. Henry (2004) notes that realness and being real is a recurring theme in third-wave black feminism. This theory also works well with black women keeping to their extraordinary beauty, different from the ordinary beauty that is shunned by the character Brad of the character Angela in the movie American Beauty (1999).

Journalism articles were included in the curriculum. I have been working as a professional journalist since 1990. Radio podcasts such as this will also be featured – I have worked in radio since about the same time I started in journalism. Plus, an analysis of online blogs concerning hair politics will be analyzed, such as this one and also this one. All this will make up a more "mainstream" media studies content of "alternative" material where the aim will be to discover deep analysis of its content and subtext.

At the end of the course, there was a section on the business of hair that was so adeptly displayed by Chris Rock in Good Hair (2009). Hair salons would traditionally straighten and style a black woman's hair, only to sell her an afro wig when she felt like exploring more freedom (Scranton 2000). The afro wigs' popularity in sales post-1960 rivaled the business of pressing and straightening hair. The afro was also the beginning of a number of other hairstyles, such as cornrows, braids and locks that you can easily see in abundance in most urban areas in North America (Scranton 2000). The last part of the course will discuss this business aspect of the politics of black hair. The final outcome of the online course was an ebook that the active participants collectively contributed to and it was published by Amazon Kindle under the sole proprietorship business of Donna Kay Kakonge, M.A.

Here is an excerpt from the ebook:
Photographs
As part of the course outline: I wanted to discuss some images I found on www.dreamstime.com, an online photo gallery. I went through about 15 pages of pictures and could only find a few where I saw natural African-American hair. The ones I did find were completely different than the texture of say My hair, for example. I consider my hair to be reallllly "Black" hair because it is very coarse, very thick, and ridiculously hard to comb, especially when dry. The natural hair I saw here was softer, looser curls. Oh, and the last picture, well I put that up because I think it's the worst weave blending job I've ever seen in my life.

The third image is a picture of a woman who seems to have a hair texture similar to mine. She's the only one I saw in her naturality. There were loads of images in this gallery, and the majority of the images had relaxed hair. I love the second woman's chiney bumps too!
This also brings me to the whole terming of "Black" or "African-American"... Obviously this woman with the flower isn't 100 per cent black; for sure she's been recently mixed with another ethnicity of some sort, right? It seems if somebody has even one drop of African blood in them, they are deemed Black. That brings up issues because then there is a huge variety of features for one race, and confusion may arise. This whole issue with Blacks is subjective in my opinion so we can either allow ourselves to be sucked in, or dare to be different
Camille James
Re: Photographs
LOl I remember the chiney bump days; I never got a chance to sport that style :(
I agree with your comment on the last picture...I don't know too much about weave, but that doesn't look right to me either :)
I understand your point about the selective use of the terms "Black" and "African-American". I have friends who are African, and they don't fit the general physical stereotypes associated with "African-Americans".
It's the same thing with Asians...most people automatically assume someone of Asian ethnicity is Chinese. It's ignorance really.
Alicia Blagrove12

- Re: Photographs

I don't know why my comment has been posted twice [second one deleted]...this system needs a prayer and some holy water...geez lol
AliciaBlagrove13

- KickApps System

Yeah you're telling me??? I've written paragraphs only to have it not be posted - glitches probably :S
Camille James

- Photos

The woman in the fourth photo looks very much like Alison Stewart, one of the anchors on "Need to Know," the weekly news program on PBS.
The pictures remind me of the variety of hair textures within my own family. My mom had five of us--and we all have different hair textures. My hair is probably the thickest, the most coarse, and the kinkiest. My older sister's hair is thick and coarse, but more of a wavy texture. My younger sister's hair is finer and prone to breakage. And there's a range of difference among our children. My older son's hair is more wiry like his dad's, while my younger son's is more reddish and curly like mine. I've had the chance to braid up my older sister's hair, along with her three daughters, and one of her sons--and I find the differences to be fascinating.
As for the question of 100 per cent Black...well, I hate to break the news, but--scientifically, there is no such thing as 100 per cent of any race, unless you come from one of those isolated peoples who intermarry among themselves. (Which means you probably won't be on the Internet!). I think this has been more of an issue

with blacks because of the legacy of slavery and segregation, where this "one drop" rule was the law. Sociologically and culturally, well, that's another discussion. Once again begs the question of whether we will be sucked in, or dare to be different...
CynthiaCarr-Johnson

- Chiney bumps

Took me a while to understand what style you were talking about, because we didn't call them chiney bumps (yea, I probably dated myself). Forgot what we called them...I tried styling my hair like that, but it just wouldn't cooperate. :-)
Cynthia Carr-Johnson

- ...and I thought I was the only one

I often get frustrated by images of our "hair." It seems for our hair to be deemed photo-worthy, we have to have relaxers, weaves, etc. And, unfortunately, the general public seems to think that our hair is or should be like what they see on TV, or in movies and magazines. I was really disappointed when I found a natural hair magazine and bought it without flipping through it. ALL of it was dedicated to weaves and extensions made from human hair. Even the one natural hair salon in my city is questionable. I went there once for a blowout and after she washed my hair, she put me under a dryer sans detangling or heat protectant. Then, she proceeded to rip through my hair with a comb!
We need to educate ourselves and the rest of the world about our hair because it's fascinating and beautiful in all of its various natural forms and textures.
Robbin Melton
Hair
Oh yeah 100 per cent Black was the wrong wording Cynthia that was my bad... You opened my eyes to realize that our race, as well as many others is very broad. You mentioned the variety of hair textures within your family... that is very true !
Camille James
I agree!
Yep, I can only identify with the third picture, too. Ironically, I thought I found some gorgeous natural hair styles, but when I clicked the pictures, they were weaves from khimitkinks! I was shocked! One weave was absolutely stunning and is the look and natural length I'd like to achieve, but it was a $300 weave! I think the hair was another $200! They even had short twist-outs!
I also get upset when I grab a black hair magazine because most of the women are not wearing natural hair. One magazine even went so far as to advertise itself as a natural hair magazine, but it was human hair weave hair!!!! I guess that could be construed as natural, but not in my book. Natural is working with the hair God gave you without much manipulation. I mean, I even feel guilty about my twist-outs because that's not my true natural texture. It's close, but not 100 per cent real. My profile pic, however, is my natural texture. Just when I go to bed at night, I can't do anything with it the next day without soaking my head in water so I just do huge twists at night so I can style it in the morning.
At least a few new television shows feature black women with natural hair...maybe. At this point, I guess they could be weaves. I used to admire the heads of Erykah Badu and Solange with her afro, but when I learned they all are wearing natural wigs...I don't even know what to think about my sisters anymore when it comes to hair.
Robbin Melton
Robbin
Hi Robbin,
I completely agree with you how sad it is to go into many hair salons or to look on magazine racks and not see many natural hairstyles on black women. This is something that really must change. Magazine images have always served to be a major influential force on the way many women wear their hair, as well as dress. Until these images change, there will not be enough black women who know they have the option of wearing their hair natural and that it can still look absolutely stunning.
Donna Kakonge
Conclusion

As far as I know, this is the first ever online politics of black hair course in its existence. It took place from July 19, 2010 to August 29, 2010. A second version of the course will be beginning on September 5, 2010 with the aim for this to be an on-going project over many, many years.
All materials for the course were completely free. To participate in the course was also free. What you see here are pioneering women who helped me with my research with OISE/University of Toronto so I can do a discourse analysis of the content towards my dissertation for my PhD in Curriculum, Teaching and Learning. The journey has been awesome!
I thank all of the women who have participated. May as many of you as possible continue on this journey with me. I also feel as though I have reacquainted myself with friends of old and new.
www.donnakakonge.com

THE READINESS OF SECONDARY SCHOOL TEACHERS IN USING COMPUTERS IN TEACHING AND LEARNING

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ABSTRACT

This research aimed to observe the readiness of secondary school teachers in using computer applications for teaching and learning. The study areas include; teachers' attitude in computer applications, inside knowledge level and computer application skill in teaching and learning process. Research respondents constituted of 142 teachers. The study was analyzed using a descriptive analysis with Likert Scale questionnaires. Study findings were analyzed using Statistical Package Software for Social Sciences (SPSS V.15.0) to determine the frequency, percentage and mean score.

By using T-test, it was found that there were no significantly differences in the mean score for knowledge, skill and attitude between male and female teachers. ANOVA test was also used to determine the frequency of using computer applications with respect to knowledge, skill and teachers' attitude. The result showed that there was a significant difference between frequency of computer usage and teachers' attitude. Due to this, some suggestions were proposed to increase awareness, skill and knowledge on computer applications in teaching and learning process.

INTRODUCTION

Education in Malaysia is an ongoing effort to develop the potential of individuals in a comprehensive and integrated approach in creating balanced, harmonious and high morals. It has enshrined in the National Philosophy of Education. In the realization of human development as intended by the Curriculum for Secondary Schools and the Curriculum for Primary Schools is a discourse to be able to Malaysians who are balanced in terms of physical, emotional, spiritual and intellectual (Curriculum Development Centre, 1998).

Education in Malaysia once again experienced a paradigm shift with the introduction of the Smart Schools Program which is an effort to prepare the Ministry of Education (MOE) shaping the country's education system to meet the needs of the new millennium. Planning began in early 1996, in line with the development of Multimedia Super Corridor (MSC). The changes made in a curriculum that is required to be disclosed accurately. The role of teachers as facilitators between the media in the process of teaching and learning is demanding and more challenging.

Implementation Computer Program in education and smart schools as a result of changes in the educational system experienced pressure to make modifications. The significant changes proposed is the practice of teaching-learning and school management in the elements of 'smart use of technology' to prepare students for the information age (Smart School Project Team, Ministry of Education, 1997a). The use of computers in the Smart Schools also includes efforts to integrate computers into the activities of teaching and learning.

So the objectives of this study are to determine the readiness of teachers based on knowledge, skills and attitudes. Besides that the research also determines whether there are differences between the sexes in terms of knowledge, skills and attitudes of teachers using computers for teaching and learning. It also determine whether there is a difference between the frequency of using computers in teaching and learning of knowledge, skills and attitudes.

PROBLEM STATEMENT

The readiness of teachers in the use of computer based information technology is one important aspect in dealing with changes to teaching and learning to be effective. The application of information technology subjects in the syllabus given in schools is an initiative to enable teachers to familiarize themselves with computers. However, to what extent do teachers actually use computers in the optimum teaching and learning? Do teachers have the knowledge and skills in handling computers in teaching and learning? How do teachers' attitudes towards computer technology? All these questions demand a study done to determine the current use of computers in teaching and learning among teachers. Attitude towards computers is one of the factors that led to the willingness of teachers to receive the computer in daily work. Positive attitude is important to encourage someone to learn computers (Zulkifli Abdul Manaf & Raja Maznah Raja Hussain, 1994). Attitude or mental readiness factors, knowledge and skills among members are essential to a change in an organization (Steers & Black, 1994).

HYPOTHESIS STATEMENT

H_0 1: There is no significant difference between the knowledge scores of male and female teachers.
H_0 2: There is no significant difference between the skill scores of male and female teachers.
H_0 3: There is no significant difference in attitude scores between male and female teachers.
H_0 4: There is no significant difference between the frequency of computer use by knowledge.
H_0 5: There is no significant difference between the frequency of use of computer skills.
H_0 6: There is no significant difference between the frequency of computer use by teachers' attitudes.

METHODOLOGY

This study used quantitative methods as the primary approach. Descriptive approach was also used to see the current situation in schools to see the willingness of teachers to use computers in their teaching. According to Gay, Mills and Airasian (2006), descriptive design involves the collection of numerical data to test hypotheses or to provide an overview of the current situation.

A questionnaire was prepared to be answered by respondents. This questionnaire will be administered to respondents to survey the readiness of teachers to teach in national schools by using computers in teaching and learning. This study was conducted using a questionnaire that includes demography of teachers, background information of teachers, teachers knowledge of using computers, teachers attitude toward using of computers, ability and readiness of teachers in handling the computers. This study uses a quantitative analysis of statistical inference aims to find relationships and differences between the dependent variable with independent variables. Independent variable of this study is the willingness of teachers to use computers in the teaching and learning.

Population and sample study

Respondents for this study are teachers from four schools, where 60 teachers in School A, 50 teachers from School B, 55 teachers from School C and 51 teachers from School D. School A and B are in the Northeast region, while Schools C and D are in South West District of Penang. A school in this study consists of a smart school for good academic achievement based on the results of public examinations every year. While School B is a cluster school and School C and D are the normal school where the academic performance was average based on the results of public examinations every year. Questionnaires were sent to school principals for distribution to all teachers in the respective schools. The length of time given for teachers to answer the questionnaire was for a week.

RESULTS

Findings related to the willingness of teachers to use computers in the teaching and learning in schools was analyzed.

Table 1 Interpretation on the Level of Teachers Readiness to Use Computers for Teaching and Learning.

	Mean	New Value	Interpretation (Level)
Knowledge	2.6385	.53932	Medium
Attitude	2.3785	.21365	Medium
Skills	2.7592	.48492	Medium

Based on Table 1 the levels of teachers knowledge using computers for teaching and learning ia at medium level with the mean value of 2.6385. Whereas the mean value of teachers attitude is at medium level of 2.3785 and the mean value for teachers skills is also at medium level of 2.7592.

Gender

Table 2 below shows the gender distribution of respondents. Based on the table, there are 42 (29.6%) male and 100 (70.4%) female respondents

Table 2 Gender Distribution of Respondents

Gender	Frequency (*f*)	Percentage (%)
Male	42	29.6
Female	100	70.4
Total	142	100.0

N= 142

Tablel 3 Distribution Of Respondents Based On Age

Age	Frequency (f)	Percentage (%)
Less than 35 years	98	69.0
35 to 42 years	26	18.3
More than 42 years	18	12.7
Total	**142**	**100.0**

In Table 3, the majority of the respondents are more than 35 years of age that is 98 (69.0%) whereas the respondents between the age of 35 to 42 years is 26 (18.3%) and the respondents which are more than 42 years of age is 18 (12.7%).

Table 4 Distribution Of Respondents Based on Teaching Experience

Teaching Experience	Frequency (f)	Percentage (%)
5 years and less	81	57.0
More than 5 years	61	43.0
Total	**142**	**100.0**

Based on Table 4, there are 81 respondents with teaching experience for 5 years and less, that is 57.0%, and 61 (43.0%) respondents with more than 5 years teaching experience in schools.

Table 5 Distribution of Respondents Based on Frequency of Computer Use

Frequency of Use	Frequency (f)	Percentage (%)
Sometimes	3	2.1
Monthly	13	9.2
Weekly	39	27.5
Daily	87	61.3

Total	**142**	**100.0**

Table 5 shows that 87 (61.3%) respondents using computers daily, 39 (27.5%) using computers weekly, whereas 13 (9.2%) respondents using computers once in a month, and 3 (2.1%) respondents using computers once in a while when necessary only. The frequent use of computers determine the high literacy level. Therefore those who frequently use computers have a good literacy skills.

Hypothesis results

$H_0$1: There is no significant difference in knowledge mean scores between male and female teachers.

Table 6 T-test Result for the Mean Score of Knowledge between Male and Female Teachers.

		N	***M***	***SD***
Knowledge				
	Male	42	31.40	6.18
	Female	100	31.77	6.62
t(140) = -.306 , p =.76				

Table 6 shows the mean scores of knowledge between male and female teachers. From this study it is found that the mean score for female teachers (31.77) is higher than the mean of male teachers (31.40). The t-test showed that there is no significant different between male and female teachers' knowledge t (140) =. 306, p =. 76 level of p <.05. This means that the null hypothesis fails to be rejected.

$H_0$2: There is no significant difference in scores of teachers' skills in males compared to females

Table 7 T-Test Results For The Mean Scores Between The Skills Of Male And Female Teachers

		N	***M***	***SD***
Skills				
	Male	42	43.48	6.78
	Female	100	44.43	8.15
t(140) =-.667, p =.51				

Table 7 shows the mean score results for male and female teachers' skills. The results showed that the mean score for male teachers (43.48) is slightly lower than the mean score for female teachers (44.43). This situation reflects the skills of female teachers in computer use for teaching and learning is slightly higher than male teachers. The t-test showed that there is no significant different between male and female teachers' skills (t (140) =-. 667, p =. 51 level of p <.05. This resulted in the null hypothesis failed to be rejected.

H03: There is no significant difference in attitude mean scores between male and female teachers

Table 8 T-Test Results For The Attitude Mean Scores Between Male And Female Teacher

		N	***M***	***SD***
Attitude				
	Male	42	44.79	4.68
	Female	100	46.04	5.31
t(140) = -.1.329, p =.19				

Table 8 shows the results mean scores in attitude between male and female teachers. The results showed that the mean attitude of female teachers (46.04) is slightly higher than the mean score of male teachers (44.79).

The t-test showed that there is no significant difference between male and female teachers' attitudes (t (140) = -. 1329, p = .19 at the level of p <.05. This decision resulted in the third null hypothesis fails to be rejected.

ANOVA test results

One-way ANOVA test was used to see a significant different between the frequency of using computer knowledge, skills, and attitudes. Table 9 shows a one-way ANOVA test results on the frequency of computer use by knowledge.

$H_0$4: There is no significant difference between the frequency of computer use by knowledge.

Table 9 One-way ANOVA Test Findings Between The Frequency Of Computer Use In Teaching And Learning With Teachers' Knowledge.

Source	***SS***	***Df***	***MS***	***F***	***P***
Between Groups	236.360	3	78.787	1.918	.130
Within Groups	5669.415	138	41.083		
Total	5905.775	141			

Table 9 shows the results of analysis of One-way ANOVA used to test whether there were significant different between the frequency of computer use with respect to knowledge. The result shows that the value of F = 1918, p = .130 was not significant at level p <.05. This means that the fourth null hypothesis stating there is no significant different between the frequency of use of computers with less knowledge fails to be rejected.

$H_0$5: There is no significant difference between the frequency of computer use of teachers with the skills.

Table 10 One-Way ANOVA Test Findings Between The Frequency Of Use Of Computer Skill.

Source	***SS***	***Df***	***MS***	***F***	***p***
Between Groups	311.159	3	103.720	1.750	.160
Within Groups	8176.736	138	59.252		
Total	8487.894	141			

Table 10 shows the results of analysis One-way ANOVA used to test whether there were significant differences between the frequency of computer use in teaching and learning with skills of teachers. The result shows that the value of F 1750, p = .160 was not significant at level p <.05. This means that the null hypothesis that state there is no significant difference between frequency of computer use in the teaching and learning with less skill failed to be rejected.

$H_0$6: There is no significant difference between the frequency of computer use in teaching and learning with teachers' attitudes.

One-way ANOVA test was used to test the relationship between frequency of computer use in teaching and learning with teachers' attitudes.

Table 11 One-way ANOVA Test Findings Between The Frequency Of Computer Use In Teaching And Learning With Teachers' Attitudes.

Source	***SS***	***Df***	***MS***	***F***	***p***
Between Groups	465.162	3	155.054	6.547	.001*
Within Groups	3268.281	138	23.683		
Total	3733.444	141			

*significant at level $p < .05$

Table 11 shows the results of ANOVA One-way analysis used to test whether there were significant difference between the frequency of computer use in the teaching and learning with teachers' attitude. The result shows that, value F = 6547, p =. 001 level is significant at p <.05. This means that the sixth null hypothesis stating that there is no significant difference between the frequency of computer use and attitude was rejected.
Therefore, post-hoc analysis was carried out to see in more detail for the existence of these differences.

Table 12 The Findings of Post Hoc Test On The Attitude Of The Frequency Of Computer Use

Frequent		Frequent	Sig.
2	V	3	.013*
2	V	4	.034*
2	V	5	.253
3	V	4	.738
3	V	5	.018*
4	V	5	.022*

* Significant at level p >.05

CONCLUSION

Discussion of research results :

(A) The level of preparedness of teachers based on knowledge, skills and attitudes.
The results shows that the level of knowledge of teachers were average. The findings of a study on the availability of knowledge is in line with the study by Iding, Crosby and Speitel (2002) who found that 65 percent of the respondents were at medium level in terms of computer knowledge. While the findings related to the level of skill is in the medium level, the findings of this study is in line with the findings made by Wahaida Wahi (2008) where the overall skill level of computer technology is moderate except for writing reports, letters and documents (M = 3.02), and print documents (M = 3.02) is considered a high proficiency. The level of computer skills that are in line with the average, Sathiamoorthy Kannan (2002) found that 71 percent of teachers are capable of managing computers in teaching and learning in schools are at medium level. The findings are also parallel with the findings by Noraini Attan (2002) that state of readiness of teachers in computer use is at a moderate level.

There are findings related to respondents' attitudes toward computers for teaching and learning that appears to be moderate. The findings of this study of attitudes contrary to the findings by Zulkifli and Raja Maznah (1994) who conducted research on teachers' training at the University of Malaya and found that 83% of students showed positive attitude towards computers and 13% being moderate.

(B) The relationship between knowledge, skills and attitude of male teachers compared to female teachers.
Results from t-tests found that there was no significant difference between male teachers with knowledge compared to that of female teachers, the male teachers (M = 32.54), while female teachers (M = 27.33). Therefore, no significant different between teachers' knowledge of male and female teachers. The finding is in line with the findings made by Wahaida Wahi (2008) which found no significant different in the willingness of teachers to use computer technology in teaching and learning for the knowledge based on gender.

T-test results also found that there was no significant difference between male and female teachers' skills. Skills in male teachers (F= 45.13), while female teachers (F = 39.33). This shows that there were no significant different between male and skill female. Findings of this study is parallel to the findings by Wahaida Wahi (2008).
The findings also showed no significant difference between male and female teachers' attitudes in using

computers. Attitude male teachers (M = 45.82), while female teachers attitudes (M = 44.92). This showed no significant difference between male and female teachers' attitudes. The findings are consistent with the findings by Wahaida Wahi (2008). This indicates that gender differences do not affect the willingness of teachers to use technology in teaching and learning.

Frequency of computer use in teaching and learning based on knowledge, skills and attitudes.
This study examines the readiness based on the frequency of computer use in teaching and learning. The results showed no significant difference between the frequency of computer use by teachers' knowledge. The study also found that there was no significant difference between the frequency of computer use with skill. But unlike the findings related to the frequency of computer use which is closely related with the attitudes of teachers.

Teaching and learning methods, such as the use of traditional books, chalk and transparency indicates inefficiencies in the current environment of competition (Ciglaric & Vilmar, 1998). As such, changes are to be made in developing and improving education. One area of concern in this study is the development of education and computer technology.

This study can be summarized that the overall availability of teachers use computers in teaching and learning in the schools studied were at a moderate level. Therefore the study showed that the level of preparedness of teachers in secondary schools are at moderate level in order to practice the use of technology, specifically the use of computers for teaching and learning.

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THE RELATIONSHIP BETWEEN SOCIAL COHESION AND COMPUTER-INTERNET USAGE

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ABSTRACT

The aim of this study is to investigate the relationship between social cohesion and computer-internet usage among university students. The research was conducted among university students in North Cyprus. The sample for the research consists of 38.8% (n=80) female, 61.2 % (n=126) male, 206 university students by using the criterion sampling method. "Hacettepe Personality Inventory – Social Cohesion Scale" developed by Özgüven (1992), the Cronbach's alpha reliability coefficient of which was the mean of reliability .82 and Biographic-Demographic Information Form used as a collecting data. Percentage documentation average, ANOVA and Pearson Moment's correlation were figured out in data analysis in this study. The statistical significance level was accepted as .05 in the study. The results of this study showed that there is a significant correlation between social cohesion as social relations and the computer usage of the university students. There is significant correlation between social cohesion as family relations, social relations, social norms and antisocial tendency with each other.
Keywords: Social cohesion, computer usage, internet usage, cohesion, internet.

INTRODUCTION

Nowadays technology and social change is being very affective on people's relationships. Especially computers are the most important technological machines that alter this relationship. For example, in face to face interaction you may find people smiling, frowning and nodding while computers have no social feedback. Computer technology affects the people's awareness of themselves, relationships with others and the world (ref. Zanden, 1990).

Social cohesion is a "we feeling" that members of a group are bound together, such as by attraction for one another (Myers, 1993). According to Durkheim, religion confirms to social values to the people and it is contributing of social cohesion. Religion, education and family life all help to improve social cohesion and strengthen the collective conscience (Tischler, 1996; Giddens, 1997; Marsh, 2000).

The concept of social cohesion refers to "good relations with the individual's environment establish this relationship and knowing the status of adopted". Social Cohesion describes the four concepts. In the first one, family relation reflects the level of family harmony with the individual's family relationships. The second one; social relation indicates the nature of the relationship between the individual with other people. In the third concept, social norms refers to the legal situation, the social rules and values need to be taken into account, being respectful of the rights of others, their own wishes and needs of society by reconciling certain behaviors, such as measures to meet the criteria as an independent attitude as well as mandatory legal situations. The last one is antisocial tendencies. People with antisocial tendency, usually a hard, full of anger, quarrelsome, prone to hard to use, are persons with feelings of revenge (Özgüven, 1992; ref. Yücel, 2007).

Cohesion behavior, defined as the degree to meet the individual's personal independence and social responsibility. Individuals depending on the degree of their lives improve more effectively behavior. All of these behaviors occur in a chain. Behavior in itself is a process chain that contains both cognitive and behavioral elements (ref. Toy, 2006). Especially, the years of adolescence is described as years of social development and cohesion. Social cohesion recovered over time but it develops some experiences in adolescence (Yavuzer 1995).

The need to spend increasing amounts of time on computer activities such as playing games, arranging files or participating in online discussion groups are indicated by psychological tolerance. Computer users are aware of this problematic behavior but they continue to use the computer compulsively. When a person is unable to access a computer they showed that withdrawal symptoms are indicated by an increase in irritability and anxiety (ref. Orzack, 1998).

According to the Young in 1996, there are lots of negative consequences of addictive use of the

computer and internet, such as familial problems, academic problems and occupational problems. The context of relationship problems caused by internet addiction has been undermined by its current popularity and advanced utility. The serious relationship problems were reported by addicts surveyed. Patients will spend less time with people in their lives (ref. Aslanbay, 2006).

Computer and internet usage, which is defined as a new type of addiction, became an important study area that attracts the interest of different disciplines including psychology, sociology and communication (Balcı, Gülnar, 2009).

In this context, this result of research will light the way for researches of academics, educational program developers, managers, educators and etc.

The Aim of the Study

The aim was to investigate the relation between social cohesion and computer-internet usage on university students.

The Problem Statements of the Study

The main problem statement of the study: "Is there any statistical meaningful correlation between social cohesion and internet-computer usage in university students?" The following sub questions were answered in order to reach the result of the main problem.

1. Is there any statistical meaningful correlation between computer usage and social cohesion?
2. Is there any statistical meaningful correlation between internet usage and social cohesion?
3. Is there any statistical difference between social cohesion and duration of computer usage?
4. Is there any statistical difference between social cohesion and duration of internet usage?

RESEARCH METHODOLOGY

Research Design

The research was made by descriptive type of associational research method. The aim of the descriptive perspective is to determine related cases. This type of research aimed to evaluate the level and the variation together between two and more variables (Karasar, 2009)

The Universe and Sample of the Study

The universe of this research is obtained on university students in North Cyprus. The sample for the research consists of 38.8% (n=80) female, 61.2 % (n=126) male, 206 university students used by purposive sampling techniques of criterion sampling method. According to modify sample of study students have their own personal computer set as a criteria.

Instruments

In the collection of data "Hacettepe Personality Inventory – Social Cohesion Scale" and Biographic-Demographic Information Forms were used. Biographic and Demographic Information Form is prepared by the researcher and it is arranged according to the suitability with the aims of the study. It is formed of 17 questions. In this form people are subjected to demographic features related to questions (sex, which department and class he/she attends etc.) as well as computer-internet related questions. "Hacettepe Personality Inventory (HKE) – Social Cohesion Scale" was developed by Özgüven and the Cronbach's alpha reliability coefficient of which was the mean of reliability .82. In HKE Social Cohesion Scale there are four subscales. These subscales are family relations, social relations, social norms and antisocial tendencies. Family relations reflect the individual's relationships with his/her family. Scores were high refers to people were friendly and healthy relationships with parents and siblings in a family that show love and is loved by his/her family. Family relations in the low score shows that the confusion and inconsistency in its dealings with the individual's family. Social relations score indicates the individual nature of its relations with other people. In terms of social relations score is high indicates a high level of the individual's maturity and social skills. These people are happy and comfortable in groups of friends and other adults give an outlook. In the low score of the individual's means that stagnant in terms of socialization and social skills. Social norms score, as well as mandatory conditions to be considered legal and social rules and values of society means being respectful of the rights of others. The high score of social norms means personal desires may be delayed according to the needs of the group's and also meets the individual's understanding of the rights of others. Antisocial tendencies to the low score indicates that an individual with antisocial aptitudes. People with antisocial tendencies are usually hard, full of anger, quarrelsome, who desire to hurt, hard to use the prone, in feelings of revenge,

disrespectful individuals. Score is higher refers that the individual has not antisocial tendencies (Özgüven, 1992).

Hacettepe Personality Inventory has a reliability score. Reliability score refers to respond careful inventory of the individual with insight and a conscious, carefully read each item to respond to reviews, such as paper fill out a reliable of the inventory answering behavior. In practice, the reliability score is lower than 5, and answer sheet in case of invalid counted and are not included in scoring (Özgüven, 1992).

Data Analysis

All analysis are performed by using the SPSS 15.0 for Windows. Considering purposes of the study percentage documentation average, ANOVA, Pearson moment's correlation were figured out in data analysis. The statistical significance level was accepted as .05 in the study.

RESULTS

In this study, 206 students were distinguished by the personal computer criteria. It was applied to the university students. The group was formed from 38.8% (n=80) female, 61.2% (n=126) male students. The following results were found according to the problem statement and sub questions of the study.

The first and second sub-questions of the research were expressed as "Is there any statistical meaningful correlation between computer usage and social cohesion?" and "Is there any statistical meaningful correlation between internet usage and social cohesion?"

Table 1. Correlation of Social Cohesion Subscales Test Scores with Computer – Internet Usage Scores

	Computer Usage	Internet Usage	Family Relations	Social Relations	Social Norms	Antisocial Tendency	Social Cohesion
Computer usage							
r	1	-.408**	.070	.166*	-.099	.009	.062
n	206	206	206	206	206	206	206
p		.000	.318	.017	.157	.899	.378
Internet usage							
r	-.408**	1	.010	-.089	.068	-.044	-.024
n	206	206	206	206	206	206	206
p	.000		.886	.205	.331	.528	.729
Family Relations							
r	.070	.010	1	.278**	.387**	.472**	.773**
n	206	206	206	206	206	206	206
p	.318	.886		.000	.000	.000	.000
Social Relations							
r							
n	.166*	-.089	.278**	1	.229**	.279**	.646**
p	206	206	206	206	206	206	206
	.017	.205	.000		.001	.000	.000
Social Norms							
r	-.099	.068	.387**	.229**	1	.334**	.665**
n	206	206	206	206	206	206	206
p	.157	.331	.000	.000		.000	.000
Antisocial Tendency							
r	.009	-.044	.472**	.279**	.334**	1	.743**
n	206	206	206	206	206	206	206
p	.899	.528	.000	.000	.000		.000
Social Cohesion							
r	.062	-.024	.773**	.646**	.665**	.743**	1
n	206	206	206	206	206	206	206
p	.378	.729	.000	.000	.000	.000	

** p<.001 statistically meaningful correlation
* p<.05 statistically meaningful correlation

The aim was to investigate the correlation between Hacettepe Personality Inventory – Social Cohesion Scale and computer-internet usage scores of the students with the scores of these scales with Pearson Moment's Correlation Test applied and these results were determined.

It was determined statistically meaningful mild positive correlation between Social Relations subscale score and computer usage scores (r=.166). Statistically meaningful mild negative correlation was found between computer usage and internet usage scores (r=-.408). It was no statistically meaningful correlation between computer usage and Family Relations (r=.070), Social Norms (r=-.099), Antisocial Tendency (r=.009) and Social Cohesion (r=.063) subscales of HKE Social Cohesion Scale.

There was no statistically meaningful correlation with internet usage scores and Family Relations (r=.010), Social Relations (r=-.089), Social Norms (r=.068), Antisocial Tendency (r=-.044) and Social Cohesion (r=.024) subscales of HKE Social Cohesion Scale.

There was statistically meaningful strong correlation with Family Relations and Social Cohesion (r=.773) subscales. Statistically meaningful mild correlation was found between Family Relations and Social Relations (r=.278), Social Norms (r=.387) and Antisocial Tendency (r=.472) subscales. It was determined statistically meaningful moderate correlation with Social Relations and Social Cohesion (r=.646) subscales. Statistically meaningful mild correlation was found between Social Relations and Social Norms (r= .229) and Antisocial Tendency (r=.279) subscales. There was statistically meaningful moderate correlation between Social Norms and Social cohesion (r=.665) subscales. Statistically meaningful mild correlation was found between Social Norms and Antisocial Tendency (r=.334). It was determined statistically meaningful moderate correlation between Antisocial Tendency and Social Cohesion (r=.743) subscales of HKE Social Cohesion Scale.

The third sub-question of the research was expressed as "Is there any statistical difference between social cohesion and duration of computer usage?"

Table 2. Comparing Student's Duration of Computer Usage with Social Cohesion Subscales Scores

Subscales	Computer Usage Duration	N	$\bar{X}$	Sd	df	F	P
Family Relations	**Not daily usage**	15	15,66	2,60	4		
	1-3 hours	18	14,38	3,69			
	4-5 hours	72	13,37	3,73	201	1,578	,181
	6-8 hours	60	13,28	3,85			
	8 hours and up	41	13,70	3,50			
	Total	206	13,66	3,67	205		
Social Relations	**Not daily usage**	15	14,60	3,24	4		
	1-3 hours	18	12,72	3,46			
	4-5 hours	72	12,59	3,67	201	1,800	,130
	6-8 hours	60	13,78	3,57			
	8 hours and up	41	13,75	3,26			
	Total	206	13,33	3,54	205		
Social Norms	**Not daily usage**	15	11,93	2,68	4		
	1-3 hours	18	12,50	2,79			
	4-5 hours	72	12,31	2,92	201	,736	,568
	6-8 hours	60	12,13	2,70			
	8 hours and up	41	11,43	3,20			
	Total	206	12,07	2,88	205		
Antisocial Tendency	**Not daily usage**	15	11,40	3,18	4		
	1-3 hours	18	11,55	3,18			
	4-5 hours	72	10,59	3,56	201	,409	,802
	6-8 hours	60	10,98	3,37			
	8 hours and up	41	10,75	3,47			
	Total	206	10,88	3,41	205		
Social Cohesion	**Not daily usage**	15	53,60	8,90	4		
	1-3 hours	18	51,16	9,88			
	4-5 hours	72	48,88	9,79	201		
	6-8 hours	60	50,18	8,98		,857	,491
	8 hours and up	41	49,65	10,11			
	Total	206	49,96	9,56	205		

The investigation was to compare the daily computer usage duration to the Social Cohesion scales with ANOVA.

It was determined that there was no significant difference to the computer usage duration during a day to the not daily usage ($\bar{X}$=15.66 ± 2.60), 1-3 hours ($\bar{X}$=14.38 ± 3.69), 4-5 hours ($\bar{X}$=13.37 ± 3.73), 6-8 hours ($\bar{X}$=13.28 ± 3.85), 8 hours and up ($\bar{X}$=13.70 ± 3.50) and Family Relations subscale scores (p=.181). There was no significant difference to the computer usage duration during a day to the not daily usage ($\bar{X}$=14.60 ± 3.24), 1-3 hours ($\bar{X}$=12.72 ± 3.46), 4-5 hours ($\bar{X}$=12.59 ± 3.67), 6-8 hours ($\bar{X}$=13.78 ± 3.57), 8 hours and up ($\bar{X}$=13.75 ± 3.26) and Social Relations subscale scores (p=.130). There was no significant difference to the computer usage duration during a day to the not daily usage ($\bar{X}$=11.93 ± 2.68), 1-3 hours ($\bar{X}$=12.50 ± 2.79), 4-5 hours ($\bar{X}$=12.31 ± 2.92), 6-8 hours ($\bar{X}$=12.13 ± 2.70), 8 hours and up ($\bar{X}$=11.43 ± 3.20) and Social Norms subscale scores (p=.568). There was no significant difference to the computer usage duration during a day to the not daily usage ($\bar{X}$=11.40 ± 3.18), 1-3 hours ($\bar{X}$=11.55 ± 3.18), 4-5 hours ($\bar{X}$=10.59 ± 3.56), 6-8 hours ($\bar{X}$=10.98 ± 3.37), 8 hours and up ($\bar{X}$=10.75 ± 3.47) and Antisocial Tendency subscale scores (p=.802). There was no significant difference to the computer usage duration during a day

to the not daily usage ($\bar{X}$=53.60 ± 8.90), 1-3 hours ($\bar{X}$=51.16 ± 9.88), 4-5 hours ($\bar{X}$=48.88 ± 9.79), 6-8 hours ($\bar{X}$=50.18 ± 8.98), 8 hours and up ($\bar{X}$=49.65 ± 10.11) and Social Cohesion scores (p=.491).

The fourth sub-question of the research was expressed as "Is there any statistical difference between social cohesion and duration of internet usage?"

Table 3. Comparing Student's Duration of Internet Usage with Social Cohesion Subscales Scores

Subscales	Internet Usage Duration	N	$\bar{X}$	sd	df	F	P
Family Relations	**Not daily usage**	13	14,92	3,66	4		
	1-3 hours	24	13,12	4,05			
	4-5 hours	76	13,80	3,73	201	,989	,415
	6-8 hours	62	13,17	3,68			
	8 hours and up	31	14,22	3,19			
	Total	206	13,66	3,67	205		
Social Relations	**Not daily usage**	13	13,84	3,15	4		
	1-3 hours	24	12,29	3,56			
	4-5 hours	76	13,42	3,69	201	1,047	,384
	6-8 hours	62	13,11	3,33			
	8 hours and up	31	14,12	3,70			
	Total	206	13,33	3,54	205		
Social Norms	**Not daily usage**	13	11,92	2,81	4		
	1-3 hours	24	12,20	2,63			
	4-5 hours	76	12,31	3,18	201	,441	,779
	6-8 hours	62	12,04	2,75			
	8 hours and up	31	11,51	2,66			
	Total	206	12,07	2,88	205		
Antisocial Tendency	**Not daily usage**	13	10,38	3,92	4		
	1-3 hours	24	10,70	3,35			
	4-5 hours	76	11,11	3,61	201	,308	,872
	6-8 hours	62	10,62	3,46			
	8 hours and up	31	11,16	2,70			
	Total	206	10,88	3,41	205		
Social Cohesion	**Not daily usage**	13	51,07	10,42	4		
	1-3 hours	24	48,33	10,31			
	4-5 hours	76	50,65	9,99	201	,579	,678
	6-8 hours	62	48,96	8,86			
	8 hours and up	31	51,03	9,13			
	Total	206	49,96	9,56	205		

The investigation was to compare the daily internet usage duration to the Social Cohesion scales with ANOVA.

It was determined that there was no significant difference to the internet usage duration during a day to the not daily usage ($\bar{X}$=14.92 ± 3.66), 1-3 hours ($\bar{X}$=13.12 ± 4.05), 4-5 hours ($\bar{X}$=13.80 ± 3.73), 6-8 hours ($\bar{X}$=13.17 ± 3.68), 8 hours and up ($\bar{X}$=14.22 ± 3.19) and Family Relations subscale scores (p=.415). There was no significant difference to the internet usage duration during a day to the not daily usage ($\bar{X}$=13.84 ± 3.15), 1-3 hours ($\bar{X}$=12.29 ± 3.56), 4-5 hours ($\bar{X}$=13.42 ± 3.69), 6-8 hours ($\bar{X}$=13.11 ± 3.33), 8 hours and up ($\bar{X}$=14.12 ± 3.70) and Social Relations subscale scores (p=.384). There was no significant difference to the internet usage duration during a day to the not daily usage ($\bar{X}$=11.92 ± 2.81), 1-3 hours ($\bar{X}$=12.20 ± 2.63), 4-5 hours ($\bar{X}$=12.31 ± 3.18), 6-8 hours ($\bar{X}$=12.04 ± 2.75), 8 hours and up ($\bar{X}$=11.51 ± 2.66) and Social Norms subscale scores (p=.779). There was no significant difference to the internet usage duration during a day to the not daily usage ($\bar{X}$=10.38 ± 3.92), 1-3 hours ($\bar{X}$=10.70 ± 3.35), 4-5 hours ($\bar{X}$=11.11 ± 3.61), 6-8 hours ($\bar{X}$=10.62 ± 3.46), 8 hours and up ($\bar{X}$=11.16 ± 2.70) and Antisocial Tendency subscale scores (p=.872). There was no significant difference to the internet usage duration during a day to the not daily usage ($\bar{X}$=51.07 ± 10.42), 1-3 hours ($\bar{X}$=48.33 ± 10.31), 4-5 hours ($\bar{X}$=50.65 ± 9.99), 6-8 hours ($\bar{X}$=48.96 ± 8.86), 8 hours and up ($\bar{X}$=51.03 ± 9.13) and Social Cohesion scores (p=.678).

DISCUSSION

In this study the aim was to investigate the relation between computer-internet usage and social cohesion in a group of university students who have a personal computer. The social cohesion refers to individually good relations with their environment. "We feeling" is important to social adaptation and proper social cohesion in the society. The social cohesion to become improves with religion, education and family. In this study family relations, social relations, social norms and antisocial tendency concepts used as a explaining social cohesion. The main aim of the study is to investigate the relation between computer-internet usage and social cohesion. It was found that as level of computer-internet usage not severely affected the social cohesion in this group. Computer usage duration is affected social relations. On the other hand, the original data show that family relations, social relations, social norms, antisocial tendency and social cohesion related with each other.

According to Milliyetçi's study examined the relationship between social skills and attitudes towards the internet, the findings shows that no statistically meaningful difference between social control,

social sensitivity, social expressivity, social skills and the use of internet (Milliyetçi, 2008). Also in this study was not found statistically meaningful relation between internet usage and social cohesion as a family relations, social relations, social norms and antisocial tendency was not found.

The study average of South Korean students spending 23 hours during a week for gaming and another 1.2 million are probably believed to be at risk for addiction. Therapists worry about the increasing number of student's low school success, dropping out from school to spend time on computers. Internet addiction is resistant to treatment and high relapse risks regrettably (Block, 2008). In this study it was determined that most of the students using 4-5 hours both computer and internet usage during a day. So it is a cause of personal, familial and social problems and shows us probably most of university students to be at risk for computer-internet addiction.

CONCLUSION AND SUGGESTIONS

The present study indicates that computer usage duration was related with the social relations. The internet usage was not related with social cohesion as family relations, social relations, social norms and antisocial tendency. Also denote that the students use computer and internet at least 4-5 hours a day. It shows us a part of the students become computer-internet addiction and most of the student to be at risk for addiction.

In this study, it was focused on the university students that use their own personal computer and their social cohesion. As related with findings we are aware of the effects of computer and internet usage on family relations, social relations, social norms, antisocial tendency and give importance to the relations of students with their parents and evvironments.

Only adolescents who attend university and who have families with higher socio-economical status and education participated. Low socio-economical status of the family, low education may be some other factors related with computer-internet usage and social cohesion, a sample having wide range of these characteristics should be formed. Having a large sample of students with different backgrounds may enable to generalize the results to the community. If the further studies could be applied to other age groups like secondary and high school students, a varity of views may occur.

University students with social cohesion vision accepted by their peers in interpersonal relations, sense of belonging to a group can survive, this is also related to him/her provides positively influence the perceptions, to show positive behavior. Around the individuals who can establish good relations with both personal and social satisfaction by providing a positive personality and self-esteem.

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THE RELATIONSHIP BETWEEN STUDENTS' EXPOSURE TO TECHNOLOGY AND THEIR ACHIEVEMENT IN SCIENCE AND MATH

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Abstract

Recently computers and information and communication technologies (ICT) have been widely used in classrooms for teaching purposes. It is important to investigate how these recent developments affect students' performance at school. In this study, the effect of ICT on students' math and science performance was examined. The data for this study comes from the 2009 administration of PISA. The sample includes 4996 students in Turkey. Hierarchical linear modeling was used for analyzing the effects of ICT in student and school levels. The results indicated that students' familiarity with ICT and exposure to technology help to explain the achievement difference between individuals and schools.

Key words: ICT, PISA, technology, achievement, hierarchical modeling

Introduction and Theoretical Framework

In recent years, computers have been used extensively for various reasons by wide user groups. School-age children use computers for entertainment, communication, and education, etc. Over the past few years, due to improvements in technology, computers and related technologies have become cheaper and more sophisticated. That is why households are both able and willing to buy computers for their children in order to give them the chance to become advanced computer users. Lauman (2000) stated that "not only is the number of computers in education growing exponentially, but also the number of computers in the home is growing at a rapid rate" (p. 196). Despite the increase in the number of computers and related technologies, everyone does not have the same access to these technologies: "Media availability varies depending on such things as child's age, gender, race/ethnicity, family socioeconomic status, and so forth" (Roberts et al., 1999, p.9).The economic level of the countries might also affect the availability of media for school-age children either at school or at home.

Parents believe that using computers helps their children's academic achievements and job opportunities (Ortiz et.al, 2011), therefore they buy computers with internet connection to help their children succeed in school (Turow, 1999).Today's computer revolution provides cheaper and better home computers that allow students to practice what they have learned at school(Stock and Fishman, 2010). Although there is an agreement among researchers that computers are useful for learning opportunities, Becker (2000) found that students use computers at home more for entertainment than for school related purposes. There are countless things that can be done with computer applications, and some of these applications might have latent impacts on children's development. For instance, computer games might be considered a waste of time by some parents. However, they may have positive effects on children's cognitive development (Hamlen, 2011; Li and Atkins, 2004). By spending time with the computers, children can learn how to "read and utilize the information on computer screens" (Subrahmanyam et al., 2001, p14). Using computers can also improve children's visual attention because some applications require users to keep track of or control many things at the same time. Durkin and Barber (2002) also found that computer games have positive impacts on adolescents.

Children are not only exposed to technology at home but also at school by new information and communications technologies (ICT). Due to having new computers and related technologies, schools are in need of new technology plans and designs. According to Kozma (2003), "teachers in many countries are beginning to use ICT to help change classroom teaching and learning, and are integrating technology into the curriculum" (p. 13). Therefore, it is necessary to develop strategies for students to effectively use

computers and advanced communication technologies that can help them to improve their academic performance (Lee et al., 2009, p. 226). According to analyses of U.S. data (NCES, 2001), students' science achievements are positively affected by teachers' computer use for certain activities at school. Papanastasiou et al. (2003) argued that students who have available computers at home and in the library have higher levels of science literacy. Lee et al. (2009) found in their study that students who were using computer 1 hour per day had better math scores. Kim and Chang (2010) stated that computer use for math was associated with reducing the achievement gap among different diverse backgrounds. It is obvious that there might be many factors affecting students' science and math performance. Technology is one of these factors; that is why it is important to explore how we can explain students' science and math achievements by looking at their use and accessibility of computers and related technologies, as suggested by Subrahmanyam et al. (2001). Notten and Kraaykamp (2009) stated that science performance is positively affected if there is a positive reading climate and computer availability at home. They also mentioned that "the absence of a television set at home seems to narrow a child's worldview and knowledge of science." (p. 379).According to Attewell and Battle (1999),mathematical performance was positively associated with having a home computer. Dumais (2009) also mentioned that using computers for fun was related to increasing math achievement.

In this study, we aim to investigate how using computers and related technologies affect science and math performance among students.

Method

Data Source

The data for this study come from the 2009 assessment of The Programme for International Student Assessment (PISA) that is an internationally standardized assessment jointly developed by participating economies and administered to15-year-olds in schools. PISA assesses the domains of reading, mathematical and scientific literacy that are covered not merely in terms of mastery of the school curriculum, but in terms of important knowledge and skills needed in adult life. Besides assessing these specified areas, the PISA includes student, parent and school surveys that have survey items related to students', parents' background, their attitudes towards different topics such as ICT.

The sample includes 4996 students (male=2551, female=2445) from 170 schools in Turkey. 169 of 170 schools were public schools while only 1 school was privately funded in the sample. Student level variables were obtained from the PISA 2009 Student and ICT survey, and school-related variables were obtained from the PISA 2009 School Survey.

Obtaining Technology Scores

In order to quantify students' exposure to technology, the questions in the PISA Student ICT Survey were used. The survey includes questions about several topics such as students' possession of technological devices, and how frequently they use these devices.

The technology scores from the ICT survey were obtained using the Graded Response Model that is a polytomous item response theory (IRT) model developed by Samejima (1969) for analyzing cognitive processes. The model is similar to the Birnbaum's (1968) two-parameter IRT model in terms of dichotomization process. The response categories (k) are dichotomized into two categories: (1) greater or equal to score category k; (2) less than score category k. With k response categories, there are k - 1 or j boundaries between the categories. For each between-category boundary, an operating-characteristic curve should be estimated. These curves can be found by using the following equation:

$$P_{ij}^{*} = \frac{e^{a_i(\theta - b_{ij})}}{1 + e^{a_i(\theta - b_{ij})}}$$

where P_{ij}^{*} is the probability of selecting category j or higher, a_i is the item discrimination for item i, θ is the latent trait, b_{ij} is the category-boundary parameter (threshold) for category j in item i. For k response categories, k-1 (or j) category-boundary parameters (b_{ij}) are estimated. These parameters basically represent the ability level necessary to have a 50% chance of responding in a category above the j^{th}

between-category boundary. In the present study, the ICT survey items have either four or five response categories that provide three and four between-category boundaries, respectively.

Hierarchical Data Analysis

In this study, hierarchical linear modeling (HLM) was used for analyzing the effects of technology on students' achievement. HLM focuses on the effects of social variables on behavior or performance. It allows examining the variance hierarchical data structures where students are nested within classes and schools. The relative variation in the outcome measures, between students within the same school and between schools can therefore be evaluated.

For hierarchical linear modeling, *lme4* package (Bates, Maechler & Bolker, 2007) in R was used. Before conducting HLM analysis, several assumptions were addressed to determine the adequacy of the hierarchical modeling. In order to see if student-level residuals are normally distributed, a histogram of observed residuals was generated. If the distribution resembles a normal distribution, it can be concluded that the level-1 errors are normally distributed (Raudenbush & Bryk, 2002). Second, multivariate normality of the school-level residuals was checked by examining the Q-Q plot of expected and observed Mahalonobis distance. A 45 degree line is the evidence of the multivariate normality of the level-2 residuals. Also, homogeneity of level 1 variance was checked. There were four hierarchical models fitted by using math and science scores as an independent variable and independent variables such as technology scores (TECH), socioeconomic status (SES), ICT use at home (ICTHOME), confidence in using computers (HIGHCONF), school size (SCHSIZE) and ratio of computers at school and school size (RATCOMP). The same models were fitted for both math and science scores. Table 1 gives a summary of the HLM models used for the data analysis.

Table 1

Hierarchical linear models used for data analysis

One-way random effects ANOVA
$Y_{ij} = \beta_{oj} + r_{ij}$ (Level 1 – Students) $\beta_{oj} = \gamma_{00} + u_{0j}$ (Level 2 – Schools)
Random intercept model: Model 1
$Y_{ij} = \beta_{oj} + \beta_{1j}(TECH) + \beta_{2j}(SES) + r_{ij}$ $\beta_{oj} = \gamma_{00} + u_{0j}$ $\beta_{1j} = \gamma_{10}$ $\beta_{2j} = \gamma_{20}$
Random intercept model: Model 2
$Y_{ij} = \beta_{oj} + \beta_{1j}(TECH) + \beta_{2j}(SES) + \beta_{3j}(\text{ICTHOME}) + \beta_{4j}(\text{HIGHCONF}) + r_{ij}$ $\beta_{oj} = \gamma_{00} + u_{0j}$ $\beta_{1j} = \gamma_{10}$ $\beta_{2j} = \gamma_{20}$ $\beta_{3j} = \gamma_{30}$ $\beta_{4j} = \gamma_{40}$
Random intercept model: Model 3
$Y_{ij} = \beta_{oj} + \beta_{1j}(TECH) + \beta_{2j}(SES) + \beta_{3j}(\text{ICTHOME}) + \beta_{4j}(\text{HIGHCONF}) + r_{ij}$ $\beta_{oj} = \gamma_{00} + \gamma_{01}(SCHSIZE) + \gamma_{02}(RATCOMP) + u_{0j}$ $\beta_{1j} = \gamma_{10}$ $\beta_{2j} = \gamma_{20}$ $\beta_{3j} = \gamma_{30}$ $\beta_{4j} = \gamma_{40}$

Note: Y_{ij} is students' math or science score in the 2009 administration of PISA.

Table 2

A summary of fixed and random effect estimates from four HLM models

Fixed Effect	**One-way Random Effects**		**Model 1**		**Model 2**		**Model 3**	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept (γ_{00})	444.909 (S) 435.047 (M)	4.921 5.923	455.4318 (S) 449.7068 (M)	4.5838 5.4447	457.0184 (S) 451.0112 (M)	4.5646 5.4386	490.3880 (S) 489.1635 (M)	10.9657 13.1730
TECH (γ_{10})	- -	- -	3.5069 (S) 3.4073 (M)	1.0549 1.1307	8.7179 (S) 8.7283 (M)	1.4145 1.5144	8.635213 (S) 8.6464 (M)	1.4148 1.5147
SES (γ_{20})	- -	- -	9.2202 (S) 12.4057 (M)	0.7782 0.8348	7.5709 (S) 10.5984 (M)	0.8545 0.9152	7.5818 (S) 10.6041 (M)	0.8544 0.9151
ICTHOME (γ_{30})	- -	- -	- -	- -	2.6854 (S) 2.6793 (M)	0.9251 0.9905	2.6912 (S) 2.6794 (M)	0.9251 0.9904
HIGHCONF (γ_{40})	- -	- -	- -	- -	5.6896 (S) 6.2660 (M)	0.7128 0.7630	5.6766 (S) 6.2532 (M)	0.7128 0.7629
SCHSIZE (γ_{01})	- -	- -	- -	- -	- -	- -	-0.0208 (S)* 0.0235 (M)*	0.0070 0.0084
RATCOMP (γ_{02})	- -	- -	- -	- -	- -	- -	-63.0815 (S)* -73.8278 (M)*	25.1399 30.1966
Fit Statistics	**One-way Random Effects**		**Model 1**		**Model 2**		**Model 3**	
Variance estimates								
Level 1 variance (r_{0j})	2415.8 (S) 2822.8 (M)		2353.6 (S) 2701.7 (M)		2280.3 (S) 2611.0 (M)		2280.8 (S) 2611.0 (M)	
Level2 variance (u_{0j})	3986.8 (S) 5811.5 (M)		3308.4 (S) 4735.5 (M)		3221.7 (S) 4658.1 (M)		3000.2 (S) 4379.4 (M)	
Deviance	53740 (S) 54554 (M)		53275 (S) 53996 (M)		51049 (S) 51734 (M)		51039 (S) 51724 (M)	
df	3		5		7		9	

Note: In each cell, the first estimated value (top) is based on science scores (S), and the second value (bottom) is based on math scores (M).
(*) The coefficient is not significant at the alpha level of .05

Results and Conclusion

First, HLM model assumptions were checked. The output related to these assumptions was not included in this paper due to space limitations. A histogram of observed residuals was generated. The distribution was fairly normal. Multivariate normality of the school-level residuals was checked by examining the Q-Q plot of expected and observed Mahalonobis distance. The plot had a 45 degree line between two variables. That was the evidence of the multivariate normality of the level-2 residuals. Lastly, homogeneity of level 1 variance was checked by using chi-square test. The test result showed that the hypothesis of homogenous variance was failed to reject ($p > 0$ .05).

Second, the HLM analyses were performed. Table 2 shows the results of the HLM analyses. As mentioned earlier, the first model is the one-way random effects model that accounts for variance between individuals and schools without any covariate. This model was used a baseline for comparison with other three models that include several covariates in level 1 (student) and level 2 (school). In each step, technology-related variables were included in the model. Technology scores obtained from the ICT survey was not a strong predictor of science and math scores by itself. However, when it was used with other ICT-related variables, it was a significant predictor in all three models. The availability of ICT at home (ICTHOME) and confidence in using computers (HIGHCONF) were other important predictors of math and science performance in addition to the technology scores.

In the bottom of Table 2, deviance values and degrees of freedom were reported for each level in each model. Deviance values can be used for comparing fitted-models. The difference between deviance values from two models and the difference between degrees of freedom from the same models can be used as a chi-square test (e.g. $\chi^2 = \text{Deviance}_{\text{model1}} - \text{Deviance}_{\text{model2}}$, $df = df_2 - df_1$). Based on these comparisons (*not included here*), it was concluded that all models explained significantly more variance than the one-way random effects model which means that the additional variables related to ICT were helpful to explain the difference among students and schools.

In conclusion, the results indicated that students' exposure to ICT in their daily lives was a strong predictor of their math and science performance while ICT availability at school did not have a significant effect on students' math and science performance. The practical implications of this study can be beneficial for educators and policy-makers in education in terms of constructing classroom environments and designing curriculums. The results of this study are limited to 15-years old students in Turkey. Therefore, the results may not be generalized to other populations (e.g. different countries).

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THE USE OF GEOGRAPHIC INFORMATION SYSTEMS IN URBAN PLANNING EDUCATION

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ABSTRACT

Geographic Information Systems (GIS) technology is widely employed for comprehensive analyses in the analytical studies which are indispensable for any planning activity and have a substantial place in curricula of urban planning education. This paper aims to show the role of GIS in the planning education by analyzing the analytical studies realized in Tuzla, İstanbul, as a part of the courses "Internship of Analytical Survey" and "Planning Design II-III" in the City and Regional Planning Department of the İzmir Institute of Technology. This analytical survey includes five steps: (1) field works and data collection, (2) data storage and manipulation, (3) spatial analyses, (4) visualization of outcomes, and finally (5) data assessments by employing ArcGIS software. The GIS technology enables students to analyze complex systems like cities, spatial processes and geographic inputs. As GIS is a useful technology for urban planning, it should be integrated in the urban planning education.

Keywords: Geographic Information Systems, Urban Planning Education, Analytical Studies, Tuzla-İstanbul

INTRODUCTION

In the urban planning education, analytical studies have a substantial place in the planning curricula in general. In accord with the paradigm of positivism, an analytical study is vital for designing and projecting the future development of urban systems. There is a strong mutual determinism between the different components of the urban form and this is why an urban structure behaves in integrity. It is possible to reflect this integrity in a plan by projecting the future development. An analytical study is generally designed as two independent, however highly interrelated processes: field and studio works. Field works are composed of all the studies done in a place (a neighborhood unit, an area, a city, a region, etc.) which is subject to the planning activity. It includes land use studies, distribution of questionnaires, interviews, etc. Studies carried out in the field work, are organized as internship stage, and very helpful for planning students to gain practical experiences and communicative abilities (Frank, 2006).

The integration of technology to the planning education is advocated by a number of experts (Ben-Joseph, 2004; Dalton, 2001; Willson, 2008). Some experts assert that the use of technology-aided learning in planning education provides practical and pedagogical opportunities. Complex issues with respect to the 3D visualization and web-based mapping in planning can be easily overwhelmed by the use of GIS (Ben-Joseph, 2004). With the use of GIS, experts can manage large amounts of spatial and non-spatial data in the multiple layers (Dai, Lee, & Zhang, 2001; Masser, 2001). In addition, GIS facilitates the construction and analysis of urban indicators (Martínez, 2009). Since the beginnings of 2000s, the use of GIS has extended rapidly covering various fields such as transportation (Arampatzis, Kiranoudis, Scaloubacas, & Assimacopoulos, 2004), landscape design (Kong, Yin, & Nakagoshi, 2007), geo-environmental assessment (Dai, et al., 2001), and population analysis (Jokisch & Boone, 2003). The use of GIS has been becoming widespread (Peters & Hall, 2004; Pettit & Pullar, 2008), and its role in the planning process has been increasing (Drummond & French, 2008; Holden, 2000). For this reason planning schools make more room to GIS courses and train students with the ability to handle GIS software. After the graduation, students-planners can find a position in the sector more easily than their counterpart (Yin, 2010). The number of professors, academic researchers and planners using GIS are growing rapidly (LeGates,

2006b). Moreover, the need of GIS related knowledge and skills are diversified. These are the reasons why urban planners should learn GIS and related technologies (Turki, 2010).

The use of the GIS technology in the planning education has opened up a discussion in 1990s (Frank, 2006). Its application has hardly found in place and planning schools were generally reluctant to make a room in the curricula (Carlson, 2008; Chapin, 2003; Godschalk & Lacey, 2001). Today, GIS has been widely used and become substantial part of the education in general. Therefore, the use of the GIS technology should be considered as a substantial part of the core curriculum of urban planning program (LeGates, 2006a).

Even though lots of studies (Carlson, 2008; Chapin, 2003; Dimitrova, Burov, & Nikolov, 2010; Godschalk & Lacey, 2001; LeGates, 2006a) underline the importance of integrating GIS in planning education, there is a lack of studies emphasizing the use of GIS practically in the planning education. Carlson (2008) focuses on integrating GIS in teaching a field-base laboratory exercise for urban studies; on the other hand some others are in favor of organizing a quick course in using GIS software to collect and analyze data and prepare maps (Santo, Ferguson, & Trippel, 2010). However, instead of certificate program or short courses, we claim that GIS should be an essential part of the planning curriculum in the form of both a must course and practical internship period.

In the curriculum of the City and Regional Planning Department of the İzmir Institute of Technology, the internship of the analytical study was held in Tuzla-İstanbul in 9-21 August 2010. The internship lecture is the prerequisite course of the third year studio lectures, CP 301-302 in fall and spring terms respectively. Complementarities of the upper scale, including politics, strategies and application to the lower scale plans and project packages is the main purpose of the curriculum of the City and Regional Planning Department (Akpınar, Bor, Atay Kaya, & Demirkesen, 2010). İstanbul was located around the globalization discourse and then Tuzla was chosen as the field study area. The role of the GIS technology in planning education will be discussed in relation to the analytical studies realized in Tuzla- İstanbul.

In the internship period, a bundle of techniques were used: large survey analysis of area was realized and its social, economic, historical and physical characteristics were documented. Questionnaires were distributed to the households, industrial zones, business, commerce, and institutions. The public sector opinions, thoughts and aspirations were surveyed. After all these studies, a large data set containing spatial and non-spatial data were composed, stored, analyzed and mapped with the help of GIS. The students learnt that the efforts of storage, analysis, and mapping of geographic data could be visualized and analyzed easily with the selection of appropriate GIS tools. GIS have proven to be essential tool in collecting and processing the various data.

MATERIALS AND METHOD

The internship course was held in August, 2010 by a study team including 20 students, 3 instructors, a specialist and 3 research assistants. The course is consisted of five steps: (1) field works and data collection, (2) data storage and manipulation, (3) spatial analyses, (4) visualization of outcomes, and finally (5) data assessments by employing ArcGIS software (Figure 1). The first step is described in the following study area and materials parts. First, Tuzla is presented; and then collected and analyzed data is described. The method part involves the steps about data storage and manipulation and spatial analyses. The final steps including visualization of outcomes and data assessments are detailed in the results and discussion part.

The scope of the “Internship of Analytical Survey” is based upon the whole activities comprising investigation, analysis and assessments. The purpose is to make a comparison of the settlement’s actual position with respect to its past situation and then to detect development potentials, trends and limitations, and eventually to project the future development akin to the real situation. Internship program in the curricula of the City and Regional Planning Department is designed as this extensive and comprehensive analysis of the settlement which is subject to planning. The program generally takes place in the summer period. After the internship, the planning activity took place in the fall and spring semesters. In the program, it is expected that students can have an ability to manage the whole planning process, beginning of drawing the real data from the field and then processing them into the plan of the settlement. The

program is designed as close as the real situation of the planning in the Turkish context. At the end, the students can have an ability to comprehend the whole process and gain expertise to manage the complex data set which is the basic input of the planning activity.

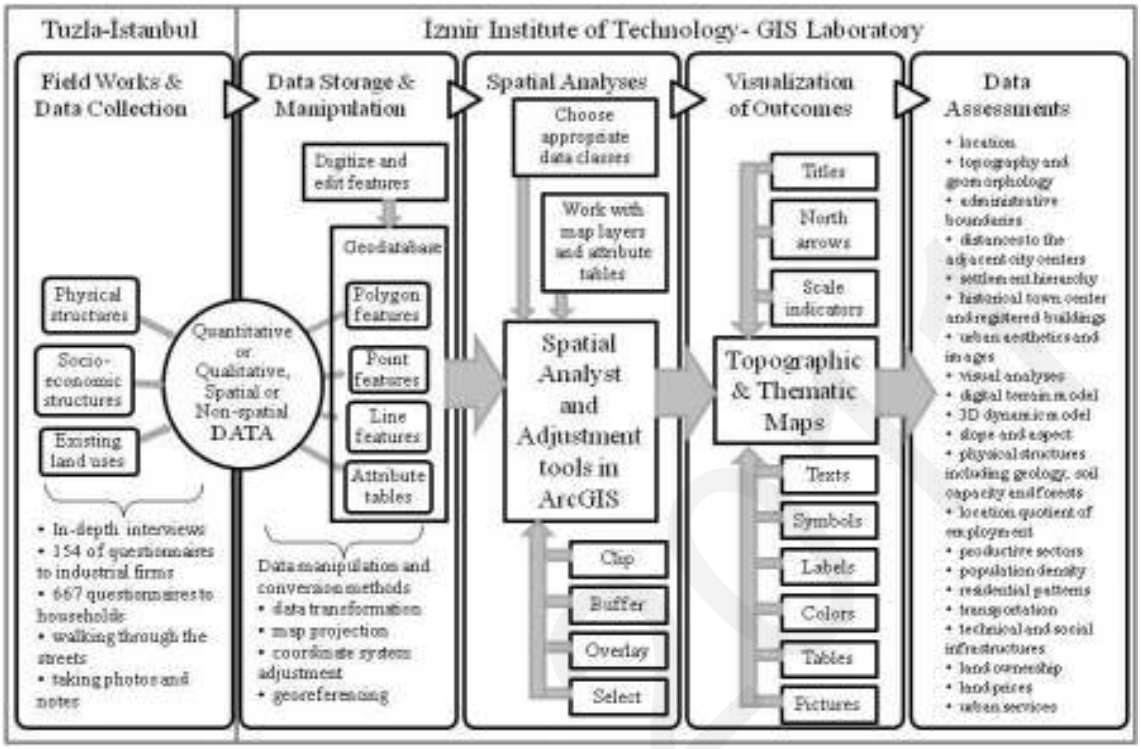

Figure 1 Steps of the Methodology

Study Area

Tuzla is the one of the 39 towns of İstanbul Metropolitan Area. Tuzla is located on the eastern part of the city, can be considered as an edge zone, and opened up the city to Anatolian Peninsula (Figure 2). The population of Tuzla has 185.819 people in the census of 2010, in an area of 123 kilometer squares (TSI, 2010). The district is full of heavy organized industrial zones, a free trade zone, and the biggest shipyard of the nation. Also, an International Airport, large university campus areas, natural areas, a historical town center and various urban areas can be found together in Tuzla which presents a rich study area for planning activity.

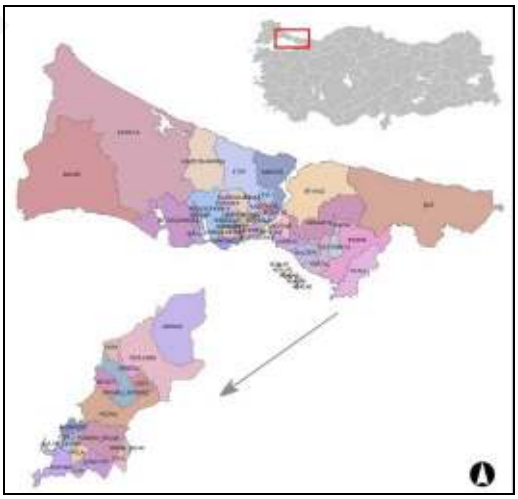

Figure 2 Study area

Materials

The analytical survey consisted of various researches including physical structures, contextual position of Tuzla in global, regional and national level, and socioeconomic variables. Physical structures covered extensive research on geologic, geomorphologic, topographic, climatic and environmental situations. Spatial organization and its evolution in time series were analyzed. Social, demographic and economic conditions, in relation to the employment and production sector analyses were done extensively. Property relations, land values and their fluctuations were investigated heavily. Existing land uses were detected and transferred into the maps. In-depth interviews were realized with the public employees. Beside all these formal studies, informal talks with the lay person in the streets, unprecedented interviews were also taken place. The field study covers the two intensive work weeks in Tuzla. At the end of the internship period, a 154 of questionnaires were distributed to the industrial firms and 667 questionnaires were done with the households living in Tuzla.

Socio-economic structures of families, housing conditions, life quality of the environment, demographic trends, employment structures, and etc., were explored. Economic activities, trends and problems were detected. Urban services and infrastructures were analyzed. Large scale land-cover and land-use analysis were conducted. All these studies were realized by walking through the streets, taking photos and notes, as well as talking with the people.

The next phase after the field study was composed of enumerating of the whole data set, whatever they were, quantitative or qualitative, spatial or non-spatial. The data obtained from the questionnaires were transferred into the SPSS program and a data base was composed. Statistical analyses were performed about the demographic structure. Moreover, socioeconomic position of the households with respect to the income, employment structure and education were analyzed statistically. At the end of all these extensive and intensive works, a research report was written.

Method

The data processing was started after two weeks with a training course about GIS and their application in urban planning. The data collected during the field work were stored, analyzed and visualized in ArcGIS software in the GIS laboratory. In addition to GIS, statistical programs, SPSS and Excel were employed in the study.

The geodatabase were provided to the students. Then, they stored the data they collected in the field works. The database includes polygon features to show different land-use zones and buildings; point features are employed to show schematically downtown and landmarks; and finally line features are used to indicate roads and administrative boundaries. Attribute tables are added to indicate all kinds of properties in the geodatabase. At the end of all these procedures, students have an ability to join non-spatial information to the spatial datasets. In the final phase, all pieces of work were merged into a single geodatabase.

In addition to the primary data collected from the field, there were the secondary data acquired from the municipality such as the maps of topography and property ownership (cadastral map). Not all these secondary data were in GIS format, some of them were in various data types such as ‘dwg’ format of AutoCAD and ‘ncz’ format of NetCAD software. Therefore, there was a need of converting data. The data in different formats were converted into ArcGIS format. Besides, there have been some mismatching parts among the data coming from different sources. This problem was solved by the data manipulation and conversion methods such as data transformation, map projection, coordinate system adjustment and georeferencing.

After storing and manipulating the data, various spatial analyses were performed by the students with the help of the spatial analyst and adjustment tools in ArcGIS. Students learnt to manage the data in this step. Depending on the type of analysis, they chose appropriate data classes and created thematic maps employing colors, labels, tables and pictures in accordance with the emphasis of objects. For example, when they analyzed the ownerships of the land, they arranged the legend by emphasizing the landowners and added a table and a pie chart showing the percentages (Figure 3). On the other hand, when they made a slope analysis, they prepared a 3D dynamic model of the terrain (Figure 4).

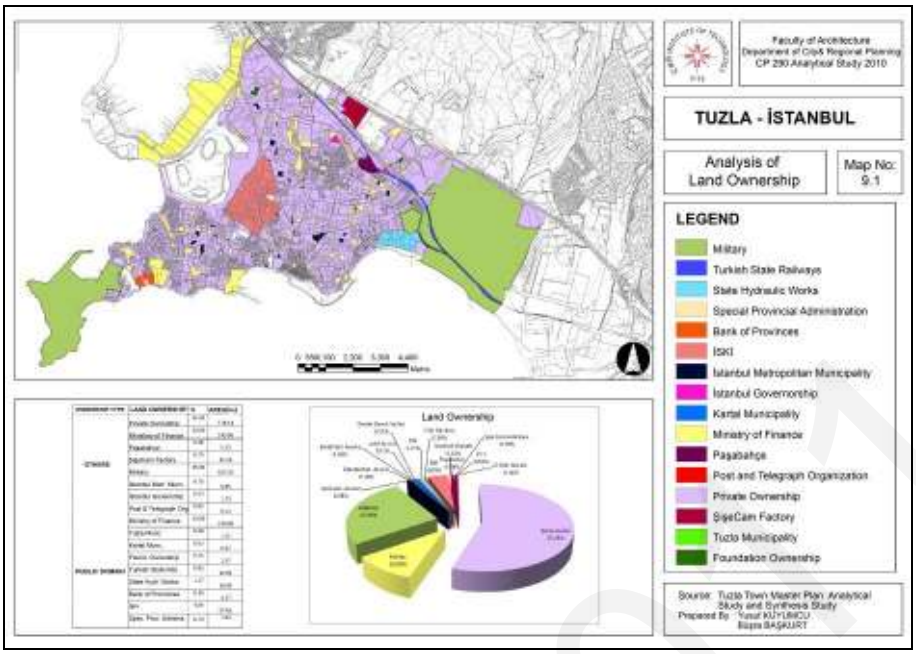

Figure 3 Analysis of Land Ownership

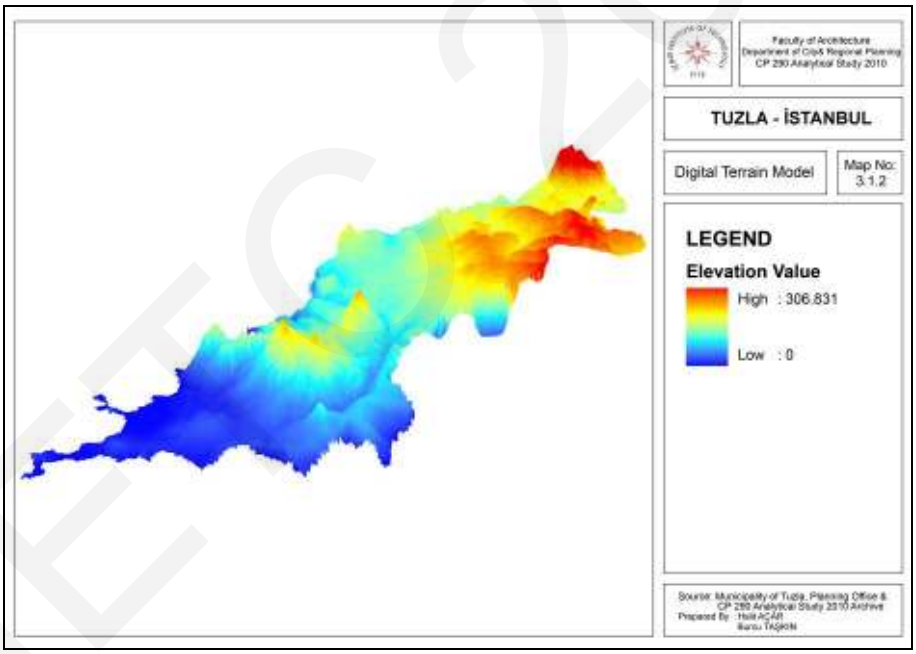

Figure 4 Digital Terrain Model

RESULTS AND DISSCUSSION

Planning students attending the analytical survey of Tuzla prepared several topographic and thematic maps in various scales in terms of analysis types and printed them in both A0 and A3 extended maps. These maps show the location of Tuzla in the metropolitan area, topography and geomorphology of the study area, administrative boundaries, distances to the adjacent city centers, settlement hierarchy, historical town center and registered buildings (Figure 5), urban aesthetics and images (digital photographs of some important buildings), visual analyses, digital terrain model, 3D dynamic model, slope and aspect, physical structures including geology, soil capacity, and forest areas, location quotient of employment, productive sectors, population density, and residential patterns (Figure 6). Transportation analyses, technical and social infrastructures, land ownership, land prices, urban services and their

distribution, and other urban sectors were visualized into maps. To produce these maps in ArcGIS, students learned to create and modify geodatabases, created and managed geographic or spatial features consisting of the objects of the points, lines and polygons. In addition to these, they digitized and edited features, set coordinate projections coming from different map sources, converted the data from different data formats such as CAD files. They exported and imported files to and from other computer applications. They also worked with map layers and attribute tables, adjusted symbols and label features, adjusted transparency values, processed data with spatial analyses using tools such as clip, buffer and overlay, selected data with attribute and location based queries, and designed layouts of the maps by adding titles, graphs, pictures, texts, north arrows and scale indicators.

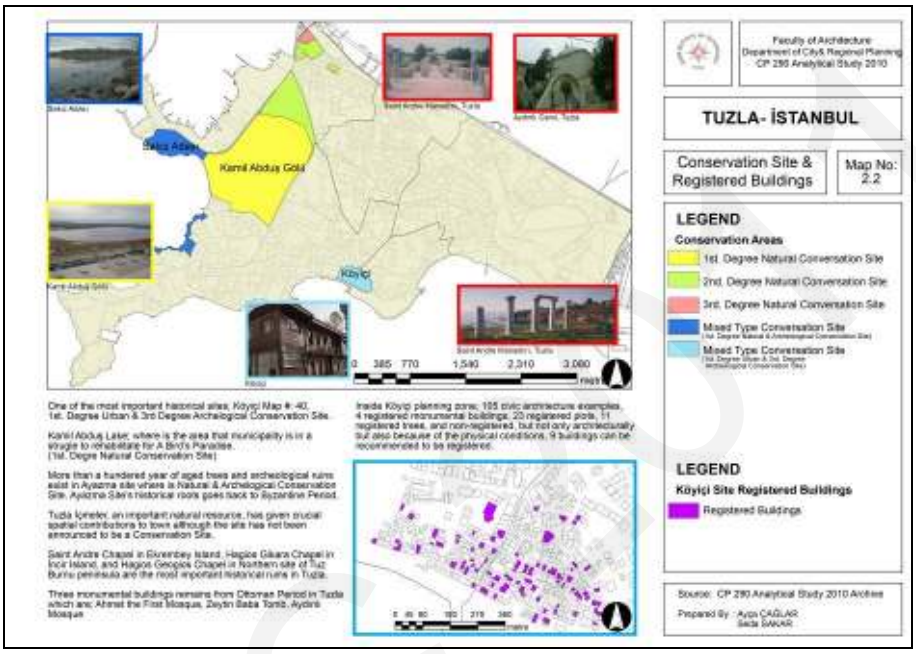

Figure 5 Conservation Site and Registered Buildings

Figure 6 Analyses of Settlement Pattern

GIS provide ease of the management of large data set obtained from different sources with different formats. Students can create a single geo-database and use the data as a necessary input to the various planning activities.

CONCLUSION

Today planning students are more and more increasingly required computer skills than before. With the use GIS software, statistical analyses can be performed as the outcome in the form of digital maps which can ensure visual interpretation as computer-aided applications in planning activities. The GIS technology gives students the ability to relate geographic information coming from different sources, make linkages of non-spatial data to spatial data, analyze spatial, natural, demographic, economic variables by using multiple layers, and arrange scales and map projections. The GIS technology provides analytical survey more easy and fast in terms of data collection, data storage and manipulation, spatial analysis, construction of the 3D digital terrain model, visualization and finally assessment of outcomes. For these reasons, the use of GIS is indispensable for spatial analysis and its application is becoming widespread.

Technological advances provide wide range of facilities for planners. Expert planners dealing with the management of the complex systems like urban areas need extensive and intensive data sets for solving the problems, simulating the complex systems and creating linkages of the sophisticated relationships. GIS software is proven to be essential instruments of the management and assessments of large collection of data. The software application has founded itself more place in planning and planning students in via of constituting their professional identity have to learn it effectively. GIS provide convenience and time-saving in an urban world that is overwhelmingly changing, transforming and sophisticated. The visualization and assessments of large and complex data set in a form of maps provide easy access of visual information which can be shared by a large part of citizens in interactive ways. Planners can express themselves, solve the problems and communicate by large part of the population in a planning process. For these reasons, GIS applications provide ability for the planners to manage complex urban systems and behave in a proactive manner. Therefore, education programs of the planning schools should include GIS applications.

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THE USE OF INFORMATION TECNOLOGY IN TEACHING CARTOGRAPHY

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ABSTRACT: This study is a report on a learning experiment involving secondary school pupils with the aim of using information technology techniques to acquire cartographic skills. The Google Maps and Google Earth programmes available on the Internet provide an infinite number of images of the whole of the earth's surface that can be selected and used as a resource to enable learners' active participation in knowledge-building. This strategy allows pupils to use cartographic codes to create their own maps of the areas in which they spend their lives and even of the most distant regions of the planet. The development of these skills is a prerequisite for the citizen to interact with modern society in which technology is performing a fundamental mediating role. The school, which must always be innovative and prepared to change, cannot avoid the task of developing new learning techniques for reading and interpreting the modern world.

Keywords: cartography, google maps, teaching, geography, information technology

INTRODUCTION

We are living in a technological revolution every day of our lives. As has already been pointed out, we have been turned into citizens of the cyberculture. New information technologies affect the organisation of work and ideas so they have to be included in the world of education as working tools (Passini 2007). There is in fact a variety of multimedia resources and computer programmes that encourage dynamic and interactive study while providing a new interface between space and time, which is a vital question today since knowledge of cartography has come to be seen not as an end in itself but also as a means of interacting with reality.

Not only the written word, but also detailed images of the whole of the Earth's surface can be shared across the five continents. As well as eliminating passive learning, use of the Internet along with interactive learning provides the learner with a combination of entertainment and study (Pontuschka 2008). In this new context new reference points have to be built into research in teacher training courses (Goodson 1981). Thus the importance given to research into innovative methodologies based on forms of information technology should be linked to establishing a relationship with practical work.

The learning strategy presented here was developed taking these factors into account. Google Earth allows the Internet user to look at any point on the planet by means of satellite images. It is possible to locate in a few seconds the district and even the building in which one lives in a distant town or even to put oneself into the position of seeing a 3D image moving through 360°. The programme also permits multi-temporal analysis by providing images taken at different times, which is clearly important for understanding the changes occurring in geographical areas over time.

METHODS AND PROCEDURES

In terms of map work it is vital to develop from an elementary level of reading concentrating simply on location to more complex levels involving the decodification and interpretation of maps and providing challenging learning situations so that something more than mere cartographic literacy is achieved (Pontuschka 2008; Kaercher 1999). Given the possibilities that exist, the aim of this study was to develop the notion of space and cartographic representation based on exploring digital atlases (Vogos et alii 2009), in other words the programmes provided by Google - Google Maps and Google Earth - that are available on the Internet. The methodology that was developed includes the aims described below.

- An integrated pedagogical approach conceived in all its historical-cultural and socio-economic dimensions, giving primary school pupils an effective resource for mastering cartographic concepts;

- the use of digital images as a store of information and research on topics related to school geography, such as relief, hydrography, urban expansion, landscape development, and environmental degradation, among others and
- taking the area in which the pupil lives as a basis for acquiring knowledge about geography on a local scale in order to achieve meaningful learning.

Procedures

Working as undergraduate students, future geography teachers on teaching practice at a secondary school in Brasilia were involved in setting up strategies and creating teaching materials, going back to using mapping skills to encourage relational and multidisciplinary thinking (Pontuschka 2007), and introducing satellite images as a learning resource. The process included the following stages.

1. Diagnosis of the teaching institution.
2. Research and planning to develop the project on the theme: "The world at the touch of a mouse".
3. Developing teaching plans - "navigation guides" - containing the following specific objectives:
   - Recognizing the uses of the elements of cartography, in other words, symbols, scale, location (latitude and longitude) and directions, and using them in navigational and photo-interpretation tasks.
   - Interpreting and identifying the various attributes of the region pictured, such as types of vegetation, areas of degradation, natural landscapes, and others.
   - Understanding the configurations and spatial relationships concerning the phenomenon of urban growth in the Federal District, together with related environmental implications.
   - Making maps of the area pupils live in (district, town, journeys and places they habitually visit).
4. Carrying out activities in the school computer laboratory.
5. Final evaluation.

The Activities Developed

As Castrogiovanni warns (1999:35), the purpose for which the pupil learns the language of maps is not based on colouring or copying shapes, but in building representations based on a close or distant reality, following each step of the process. With this in mind, we show some examples of navigation aids that pupils used to guide them.

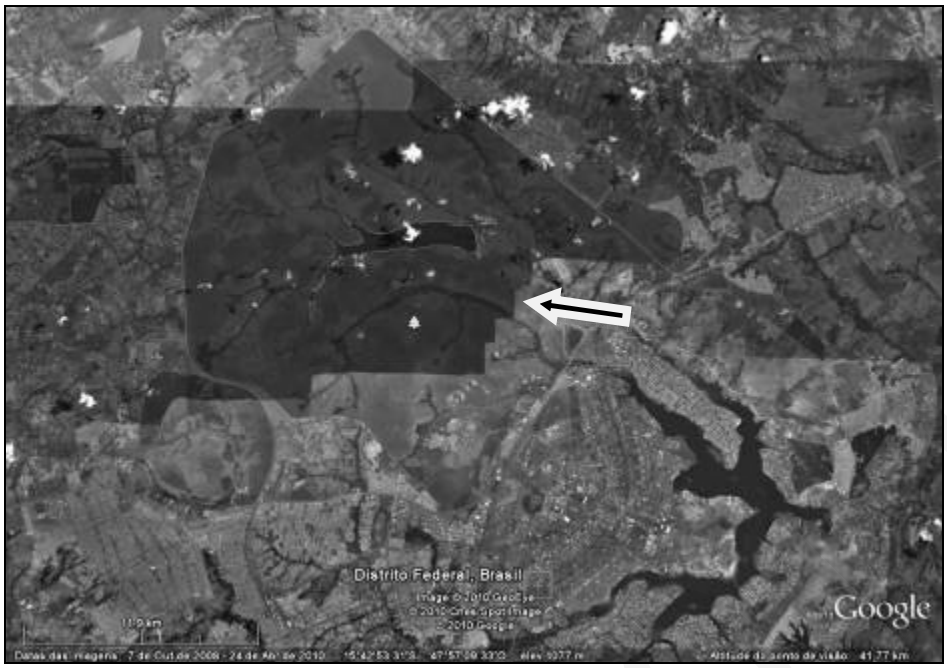
Navigation guide 1

1st Step: Location

- Flying to Brasilia, D. F.
- Going to the 'More' level and then entering 'Areas/Parks'*
- Finding the Brasilia National Park and viewing it on a scale in which its whole area may be seen.
- Placing the cursor in the centre of the lake (Santa Maria Lake, a major source of Brasilia's water supply) and checking the altitude. Then finding the altitude of the outlying areas of the park.

What conclusion can be formed?

*These environmental protection areas are already indicated in the images.



Comments: based on the differences in altitude within the park it is possible to identify the direction of run-off.

2nd Step: Recognizing Places

- Placing the cursor on the northernmost point of the park (the apex) and tracking the external areas of the boundaries of the park in a clockwise direction.
- At the edges of the park we find:
  urban areas ( ) roads ( ) cultivated areas ( ) natural vegetation ( ) areas of environmental degradation ( ) de forested areas ( )

What are the risks to the park's quality associated with the closeness of rural and urban districts?

What type of degradation was found? What has caused it?

Comments: The areas indicated by the arrow show the process of degradation, that is, accelerated erosion. The danger caused to the park by this phenomenon was discussed with pupils. In addition, examining the areas surrounding the park enabled pupils to evaluate and comment on current risks (fires, pollution by pesticides, squatters).

Navigation guide 2
1st Step: Physical Phenomena of the *Cerrado* (Savanna)
Within the park area, three shades of gray may be seen. Each of them corresponds to a phenomenon within the *cerrado* biomass.

Identify these three physical phenomena in the picture: Gallery Forest, *Cerrado*, Open *Cerrado*.

Why do these different types of vegetation exist?

Comments: It was found that pupils were quite efficient in identifying the different types of *cerrado* because the images could show a scale that gave a very detailed view. The pink and yellow pins in the image show, respectively, Gallery Forest and *cerrado*.

RESULTS

Among the actions adopted here we can indicate new contributions to help future teachers define resources and learning strategies and make lesson plans. We should first of all mention the mastery of techniques to help build knowledge through functional activities (observing, collecting, recording data in a form relevant to the proposed aims, producing reports, graphs and tables for data analysis, relating the information obtained to previous knowledge; putting the knowledge into systematic order; applying acquired knowledge in new situations and re-formulating and anticipating new questions to study).

Secondly, the concept of strategies and plans for building knowledge in geography encourages understanding and the study of the processes involved in the occupation of space and in the development of society. The final part of the project will be the production of a CD-ROM to be used along with the activities developed with Google Earth, revised and expanded to enable users to take advantage of the latter programme's potential in terms of geographical knowledge and application, as well as in daily life.

We strongly believe that both future student teachers of geography as well as those already working in education will be able to experience a new way of understanding geography using a powerful tool, within an environment of dynamic learning.

CONCLUSION

Recognizing the usefulness of the elements of map work, that is, symbols, scale, location (latitude and longitude, direction) and using them in the activities of navigation and photo-interpretation has become a vital skill for today's citizens. For the modern knowledge society, the interpretation and identification of the various elements of the Earth's surface such as types of vegetation, degraded areas, natural landscapes and others, constitute a basic tool in understanding the interfaces between people.

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THE VIEWS OF 4TH AND 5TH GRADERS ON THE USE OF WEBQUEST IN LEARNING

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ABSTRACT

The purpose of this study was to examine the perspectives of primary school students about the use of WebQuests in learning. There were nine graduate students (primary school teachers), twenty-six 4th and thirty 5th grade students involved in this study. The graduate students developed their WebQuests as a project based on their interest areas, which were appropriate to the level of primary school students. This study took place about eight weeks during a graduate course. After the development of the WebQuests, the graduate students implemented their projects to their students. The researcher gave a questionnaire including open-ended questions to both graduate and their students who stated their perceptions on the development and implementation of the WebQuests. In this study, the researcher only examined the views of the primary school students on the use of WebQuests. After the collection of the qualitative data, the researcher examined the data by coding and classifying them. The study showed that both 4th and 5th grade students stated that they liked learning from internet and this new learning environment. Moreover, they claimed that they found something very interesting with WebQuests that enhanced their motivation towards learning. They also added that they learned new information about the topics and they revised their knowledge. However, some of the participants pointed out couple of limitations about the use of WebQuests.

Key words: WebQuest, primary school students, internet, teaching technique

Introduction

There are many factors, such as real-life activities, teachers' knowledge, instruction, gender, prior knowledge, parental-care, curricula, peer-interaction, use of technology, and so forth playing important roles on the students' achievement and motivation in learning (Middleton, 1995; Stipek, 1998). Today, most of the people, in particular, the students use the internet in their daily life. Therefore, many researchers and educators recommend the use of internet in the classes because it is a great source of knowledge for both teachers and students (Schofield, 1995; Dodge, 2001; Halat, 2008b). One fast emerging use of the internet is web-based activities (e.g., Wei & Chen, 2006). "WebQuest" is a computer-based learning and teaching model in which learners are actively involved in an activity or situation, and use the Internet as a resource. Likewise, Lamb & Teclehaimanot (2004) claimed that WebQuests are a student-centered and project-based approach to teaching and learning, which is supported by a variety of theories including the following areas: constructivist philosophy, critical and creative thinking, situated learning environments, cooperative learning, and engaged learning.

WebQuest has become very important in many educational areas and has received considerable attention from teachers and educators since it was proposed and developed by Dodge (1997). Dodge (2001) defined two types of WebQuests: short-term and long-term. Besides, according to him, well-designed WebQuests—either short-term or long-term—consist of the following critical attributes: Introduction, Task, Process, Resources, Evaluation, and Conclusion (Dodge, 2001 Kelly, 2000).

Though educational theories and models, such as van Hiele theory, constructivism, behaviorism, multiple-intelligence, cooperative learning and others, help teachers and students, it seems at times that a theory or model is inadequate when applied to curriculum (e.g., Swafford, Jones & Thornton, 1997; Billstein & Williamson, 2003). So if we support curriculum development that uses technology based on these theories or models we might be more successful in teaching and learning (Timmerman, 2000; Perkins & McKnight, 2005). In particular, the use of computers with well-prepared educational software

would enhance teaching and learning. It is clear that the Internet has a great influence on both students and teachers (e.g., Wei & Chen, 2006). Therefore, an instruction supported with webQuest-based applications including use of technology and the Internet might help students overcome their difficulties and enhance their motivation in teaching and learning mathematics. Research shows that there have been many studies conducted in different areas about the WebQuest and its implementation since 1997 (e.g., Halat & Jakubowski, 2001; Wilson, 2008; Sox & Rubinstein-Ávila, 2009; Altstaedter & Jones, 2009; Öksüz & Uça, 2010; Cameron & Champbell, 2010; Subramanian, 2010). Mostly they did their studies with pre-service teachers. In this study, the researcher examined the perspectives of the primary school students on the implementation the WebQuests.

Method

The researcher used a qualitative research method in this study. It is one of the best methods so as to get more detailed information about any problems, issue, event, or any theory implementations, and get clear and better answers of how and why questions in a research study (McMillan, 2000). The researcher chose this method because he wanted to get more and intensive information about the implementation of the WebQuests at the primary school level.

There were nine graduate students (in-service primary school teachers), twenty-six 4th and thirty 5th grade students involved in this study that took place in an elective graduate course, New Approaches in Mathematics Teaching. The graduate students developed their WebQuests as a project based on their interest areas, which were appropriate to the level of primary school students. The topics of the WebQuests were "geometric figures", "natural disasters", "step by step Turkey", "our culture and its elements", "heart and blood circulation", and so forth. This study took place about eight weeks. The researcher explained the theoretical structure of a good webQuest and showed how to prepare one. The graduate students designed their WebQuests in the guidance of the researcher. Then they were supposed to implement their work to their students. They were free to choose the number of 4th or 5th grade students between four and ten. They practiced their webQuest with 56 students. After the practice, they asked general questions to their students, such as "what do you think about the use of webQuest in learning?, What parts of the webQuest do you like?, what are the things on webQuest you dislike? . The students wrote their answers on the papers. The researcher examined these written papers, coded and classified the students' responses. He made valuable inferences from the qualitative data. The results are presented in the results and discussion part.

Results and Discussion

This current study found that the webQuest had positive effects on the motivation of the primary school students in learning. This supports Schofield (1995) who claimed that using technology in teaching and learning has positive effects on student motivation and achievement. Likewise, according to Wei & Chen (2006), the Internet has a great impact on both students and teachers. Most of the 4th and 5th grade students gave positive responses about the implementation of the WebQuests. They stated that they liked this new teaching and learning technique. Besides, they gave some reasons why they had found WebQuests useful and amusing. For instance, "we learned new information… using internet is very good, but using it such this learning environment is much better". Moreover, many of the students claimed that while they were surfing on the internet, which was exciting, they learned a lot. One said, "Learning by a click is more efficient than other ways because I like using computer and surfing on the internet that is funny and enjoyable". These views are not different form the perspectives of the pre-service middle and secondary school mathematics teachers on using WebQuests in teaching and learning of mathematics (Halat & Jakubowski, 2001).

In this study, primary school students expressed that they found something very interesting with WebQuests that included animations, nice figures and pictures, and good stories, or adapted scenarios, such as Keloğlan, Şirinler, Harry Potter, Hugo, Sünger Bob, and so on, added that this enhanced their motivation towards learning. According to the students, animations and other interesting parts made the webQuest attractive and different from the other teaching techniques or approaches, in particular, from the traditional way of teaching in the classrooms. For example, "I completed the study because of the story used in the WebQuest. I gave my full attention to the study because I wondered what was going to

happen at the end of the story. Therefore, it wasn't boring for me to complete the study that I liked", "There were several videos on the webQuest helping me to understand the topic very well. Including videos in teaching was a great idea", and "we found the information on the webQuest that couldn't be found in the textbooks. The webQuest also included more figures and pictures than the textbooks, which helped students to learn the topic very well and retain the information effectively". The finding of this study was lined up with the claim of Middleton (1995) who stated that real-life examples or activities were major motivating factors in a mathematics classroom. He added that it seems using real-life applications, group practices, hands-on activities, and other strategies played important roles in students' motivation. Similarly, according to Halat & Jakubowski (2001), the pre-service middle and secondary mathematics teachers stated that "they felt that this environment allowed students to apply geometric concepts in real-life applications using technology. Projects included topics such as the Bermuda triangle, sports, and music. The use of webquests provides K–12 students with appropriate educational uses of the Internet" (p.3).

The students stated that the webQuest could be used in other classrooms, such as Mathematics, Social Science, and Science and Technology classrooms. For example, "we would have understood the lessons very easily if our teachers had used the WebQuests in our classrooms", "the topic, matter, in the Science and Technology classroom was explained easily with webQuest. Therefore, the ones who felt weak in mathematics could study the math topics on the WebQuests that presented the topic in a game or story including figures, funny pictures and videos. This could help these students to learn the topics easily and efficiently in mathematics". Furthermore, one student said that this technique could be used efficiently in story-writing in the Turkish classes, which enhanced our thinking. In addition, it could be beneficial in teaching some topics, such as weather forecast, climate, water -circulation, evaporation in the Social Science classes. And, one student added, "I believe that webQuest can be more useful in Social Science classes than in other classes, and a topic taught in a week can be taught in a short time with the use of WebQuest". However, one of the students involved in the study, on the contrary, said that it couldn't be used in other classes. For example, it was necessary to do some complex operations in mathematics. So, we were not able to ask anybody if we did not understand any points in the topic.

Some students claimed that the teachers could use traditional way of teaching style but, at the same time they could use the webQuest in the classrooms because sometimes it (traditional way of teaching) became very boring. So, the webQuest could be a break for the students who got bored. And one said, "While the teacher was teaching, I got bored, but I did not get bored when I was working on the computer by myself. I liked the webQuest. I liked computer classes in which I enjoyed a lot". Furthermore, one stated, "I prefer learning from the webQuest instead of other ways because it is funny and there is a competition and reward in learning on the webQuest. You get nice rewards if you successfully complete it…It is like playing a game". Likewise, one student said, "I understand well when the teachers use different methods in their teaching. Studies like this one are more instructive and more entertaining". However, this student added, "although I follow the directions and reach the results by myself, I suppose I cannot pay attention to all things. I think that if the teacher shows or explains the points I do not understand, then I can learn things better". This is not in contrast with the claim of Dudeney & Hockly (2004) who state that while the students are working on the WebQuests, they should be reminded about what they are doing, why they are doing it and what the benefits are to them because it is very easy for the students to not think of the benefits and view regular visits to the computer labs as a waste of time.

Moreover, some of the students expressed that while they were working on the webQuest, they felt as if they were in the story and played the roles of Hero or the characters. For example, one said, "I felt as if I were Harry Potter in the scenario. It was great for me to save the Harry's life. I saved the life of Harry by giving right answers to the questions. So, I felt as if I were in the story or in the game". Similarly, another student expressed, "I felt as if I were Keloğlan in the competition…I achieved to help Keloğlan who got married with King's daughter. I felt as if I were there during the competition, or I were in a knowledge competition. He never became hopeless throughout the competition, I did, too. So, I trusted myself throughout the competition, and this enhanced my self-confidence. This was good; I would suggest it for everybody."

Furthermore, one of the students expressed, "I learn better by reading. Therefore, the webQuest is good for me. I think I learn much better with this way". Another student said that she learned more

detailed information about the natural disasters, and added that she could use this information if she faced this kind of natural disasters in her real life. Similarly, the other one stated that he got more information on the WebQuests about the topic, such as solid, liquid, gas, and water- circulation and so forth. The research findings show that rewarding plays prominent roles in students' achievement in the classrooms, and enhances students' motivation towards the classes. In this study, many students claimed that they liked rewarding in the WebQuests. For example, "while I was working on the webQuest, I enjoyed and received the award as well as new information."

As a conclusion, the findings about the use of webQuest at the primary school level encourage the teachers or educators to develop WebQuests and implement them in the classes. Moreover, it is clear that this teaching and learning technique can be used in any classes, such as Mathematics, Social Science, Science and Technology, Turkish, and so on.

Limitations and Implications

Even though the students stated a lot of good sides of using WebQuests in teaching and learning, they also claimed that there were several limitations in the use of it. For instance, there was a common view shared by the students was that when they were visiting other websites for the information, or formulas, they wanted to go or visit other links. In other words, they had hard time to go back to the webQuest when they were visiting the other websites. This is lined up with the finding of Halat (2008a), "students may not come back to the webQuest portals and complete their works if they are distracted by other websites that they might find more appealing or attractive" (p.110-111).Moreover, several students claimed that reading the story, making connection to the internet, doing the assessment questions and watching the videos took a lot of time. This bored and tired them. Likewise, another one claimed that one weakness of the webQuest was use of time; it took a lot of time. In addition, the other student added, "Sometimes I had difficulties with making connection to the internet" and there were other students stating that the suggested websites as resource had a lot of unnecessary information about the topic I was looking for". Besides, some students expressed that the one who couldn't use the WebQuests did not have basic use of internet knowledge. This result supports the reports of Halat (2008a) who argued that limitations in using WebQuests include the possibility of lack of access to the Internet, and finding reliable links for resources for the webQuest.

Although there were several limitations in using webQuest in the classes, there were many good sides with the use of it. And, it has also positive effects on students' motivation. This current study implies that using webQuest in learning may be helpful for the students to overcome their difficulties they face in some of their classes, and developing and implementing WebQuests may be beneficial for the teachers to attract their students' attention to their classes and increase their students' achievement in the classes.

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Appendix


Harry Potter
Giriş
Amacımız
Ödüller
Bölüm 1
Bölüm 2
Bölüm 3
Bölüm 4
Bölüm 5
Bölüm 6
Değerlendirme


Merhaba Arkadaşım,
Benimle birbirinden güzel maceralara katılmaya hazır mısın? Ülkemizi gezmek için dünyaca tanınan bir çift gelecek ve senin görevin onlara ülkemizi en iyi şekilde tanıtmak. Bir hafta boyunca bu ünlü çifte, ülkemizin yedi bölgesinde yer alan yedi farklı ili benimle birlikte onlara tanıtmaya ne dersin? Hazırsan hangi ünlü isimleri gezdireceğimizi açıklayacağım.
Aşağıdaki linklere tıklayarak bu kişilerin kim olduklarını görebilirsin?
http://tr.wikipedia.org/wiki/David_Beckham
http://tr.wikipedia.org/wiki/Victoria_Beckham
Dünyaca ünlü futbolcu David Beckham ve şarkıcı eşi Victoria Beckham'la ülkemizin dört bir tarafını gezerken onlara rehberlik etmeye ne dersin?
Hadi o zaman maceraya başlama zamanı...
İlk yapman gereken gezdireceğin şehirlerimizi tanımak. Bunun için aşağıdaki "Şehirlerimizi Tanıyalım" a tıklaman lazım.
Şehirlerimizi Tanıyalım
Değerlendirme
Mektup Tamamlama

TOWARDS AN INTELLIGENT TUTOR FOR SOCIAL SKILLS

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ABSTRACT

Intelligent Tutoring Systems have been successfully used to enhance learning in various domains, such as physics, algebra, geometry, computer programming and others. For ill-defined domains such as social skills, the current models are, however, not sufficient.

The current paper proposes a computer-based tutor can train a person's behavior by a virtual role-playing method: monitoring the person's actions in a virtual environment, observing patterns in his behavior, matching them to predefined "good" or "bad" patterns and providing feedback to reinforce good behavior and suggest corrections for bad behavior. To this end, the current paper provides details about the development of an Intelligent Tutoring System that supports simulations of social scenarios and includes such methods for matching patters of user actions to predefined patters.

INTRODUCTION

Social skills has for a long time been an important research area, connecting good skills in social interaction to "professional success, relationship satisfaction, personal fulfillment, psychological well-being, and even physical health" (Greene & Burleson, 2003).

Two main points of view can be considered: a *psychological point of view*, where social skills development has been linked to enhancement of friendships, prevention of drug abuse or treatment of juvenile delinquency, depression or even schizophrenia (Segrin & Givertz, 2003) and a *professional / human-resources point of view*, where social skills are associated to human capital, next cu technical abilites. (Green, 2000).

In the latter sense, social skills are defined as "the propensity to behave in a manner conducive to the firm's objectives" (Green, 2000) or as the ability to make oneself understood, accepted and even followed (Daly & Vangelisti, 2003). Other research has shown also that "The increased emphasis on customer service and a more diverse workforce make solid social skills a requirement for all employees." (Joinson, 1997)

As there are both similarities and differences between the two viewpoints, it is important to note that the current paper focuses on the later aspect and views the training (tutoring) of social skills from its benefits on the professional life of the individuals, in companies as well as in schools or other organizations. A short review of training methods that range from classroom discussions to role playing is provided, as well as some arguments for using Intelligent Tutoring Systems in Social Skills training. The main proposal is that *a computer-based tutor can train a person's behavior by a virtual role-playing method: monitoring the person's actions in a virtual environment, observing patterns in his behavior, matching them to predefined "good" or "bad" patterns and providing feedback to reinforce good behavior and suggest corrections for bad behavior*. To this end, the current paper provides details about the development of an Intelligent Tutoring System (PM Game, 2011) that supports simulations of social scenarios and includes such methods for matching patters of user actions to predefined patters.

SOCIAL SKILLS TRAINING

There are important concerns in research regarding skills training, including technical, problem-solving and social skills. Skill training has been seen as a constant process that allows individuals to develop a range of responses to situations and tasks that occur in pursuing their lives (O'Donohue et al., 2003).

A definition of social skills training is provided by Goldstein (1982):"*The planned, systematic teaching of the specific behaviors needed and consciously desired by the individual in order to function in an effective and satisfying manner, over an extended period of time, in a broad array of positive, negative and neutral interpersonal contexts.*"

The specific teaching methods for social skills are summarized by Segrin & Givertz (2003) as follows:

- **Assessment**: as in the case of most skills development processes, social skills training should be

based on an initial evaluation of the current skills. It has also been argued (Smith et al., 1996) that this phase will allow an analysis of the current needs, since not all individuals would require training in the same skills.

- **Direct Instruction and Coaching:** the basic method of providing declarative knowledge (Anderson, 1993) that concerns learning basic facts (eg. „Giving positive feedback to employees keeps them motivated").
- **Modeling**: is based on showing (usually by recorded examples) different examples of social interaction, either presenting positive or negative examples.
- **Role Playing:** is the most important method, that allows individuals "to practice the desired behaviors in a controlled setting where they can be observed and from which feedback and reinforcement can be offered" (Segrin & Givertz, 2003).
- **Homework Assignments:** it is a technique used after some of the other methods, which aims to provoke individuals to deliberately try to create specific social contexts in order to *test* the skills that they have been learning.
- **Follow-Up**: it is a method of monitoring individuals' progress in order to better guide them in the future and to keep the attained skills from decaying.

POTENTIALS OF INTELLIGENT TUTORING SYSTEMS

Development of Intelligent Tutoring Systems has been seen as a potential answer to the "2-sigma" challenge proposed by Bloom (1984), that shown one-on-one tutoring with a human expert tutor as the most efficient form of instruction.

Thus it is proposed that a computer-based system that behaves similar to a human expert tutor would also have similar results. This claim has in fact been proved for several domains, including but not limited to College-level physics (Gertner & VanLehn, 2000; Shelby et al., 2001), high school algebra (Heffernan & Koedinger, 2002), computer programming (Corbett & Anderson, 1993), SQL database commands (Mitrovic, 2003), database modelling (Suraweera & Mitrovic, 2002), punctuation (Mayo, Mitrovic & McKenzie, 2000).

An ITS is usually defined as a system that has some type of *knowledge representation* of the domain it is teaching, is able to monitor the user's progress and *predict the user's abilities and skills* in that specific domain and *adapts* itself to the needs of the user (eg. changing the sequencing of information provided, the speed or the level of details according to the users' abilities). (Murray, 1998)

This definition shows why ITS have great potential for social skills training:

- they provide simple means of recording and presenting both declarative knowledge (the facts) and procedural knowledge (how facts have to be put into practice);
- they can adapt themselves to the users' abilities and focus on the problem areas;
- they are re-usable and extensible with minimum effort.

Furthermore, several researchers (Andersson et al., 2006; Kerr et al., 2002) have argued that Virtual Environments (VE) have a very important potential for social skills teachings, in that they allow *virtual role playing,* ie., a simulated environment in which users can "practice skills safely, without experiencing potentially dangerous real world consequences and [in which] the stimuli the user receives can be controlled" (Kerr et al., 2002).

AN INTELLIGENT TUTOR FOR SOCIAL SKILLS

As shown above, in the development of a social skills tutor, some initial principles have to be take into account:

- *A simulation-based setting, focused on human-computer communication*

As role play is the main method of social skills training, it is essential the a social skills ITS provides a Virtual Environment(VE) that allows development of social interaction scenarios. These scenarios have to provide the users with the possibility to communicate with simulated characters and interact with the simulated world through various objects with specific properties.

- *Knowledge representation focused on behavior patterns*

A computer-based tutor that aims to act similar to a human tutor needs some representation of domain related knowledge, called an *expert model* (Murray, 1998). In the case of social skills, the expert model needs to be able to distinguish between positive behavior and negative behavior, in order to capture such patterns in the users' actions observed in the VE.

System overview

One essential aspect in developing an ITS based on a VE paradigm is the design of the scenarios themselves in such a way that it would "allow freedom of exploration and flexibility in interactive behavior, without the risk of users missing important learning goals" (Kerr et al, 2002). Defining the learning goals and the criteria when those goals are met are important consequences of this issue.

The proposed system is thus based on two user-roles: *the user* is the trainee, the individual that uses the system to train his/hers social skills; *the designer* develops the scenarios, sets learning goals and defines criteria to consider those goals met. Figure 1 shows an overview of the system, with the two user-roles.

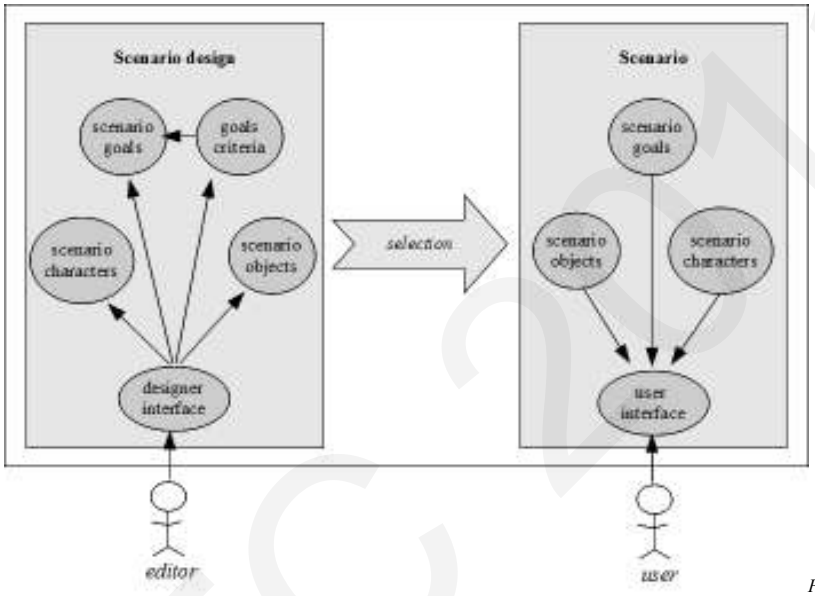


Figure 1: System overview for a VE based social skills tutor

As shown in Figure 1, the proposed system (PM Game, 2011) provides the designer with the tools needed to develop the story of the scenario (eg. "customer meeting", "employee discussion"), including objects and simulated characters that the users can interact with. The main component however is the set of scenario goals, that has to define the desired path of behavior (solution) to the scenario. As social skills are considered an ill-defined domain, in the sense of definitions provided by Lynch et al. (2006), in most cases there could be several solutions to one scenario.

The goal - feedback model

In order to implement a system that monitors the users' behavior in the VE and provides feedback based on predefined criteria regarding said behavior, the model started from the following principles:

Multiple solution paths

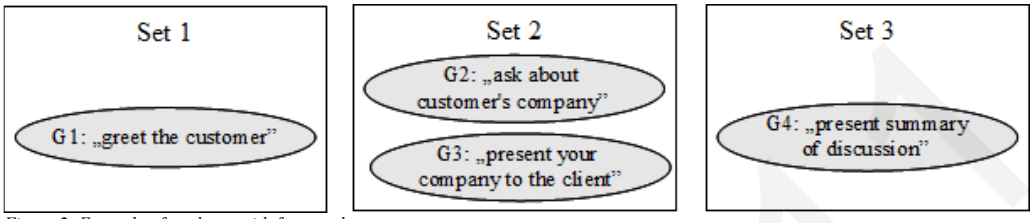
As shown above, a problem in an ill-defined domain can have more acceptable solution paths. A solution path is usually seen as a sequence of user actions that trigger a series of goals in a specific order. For example, in an example proposed by Anderson (1995) - "Write a function that joins two lists in one", the solution path is the sequence of goals: "Code 1st List"; "Code 2nd List"; "use APPEND to join lists". In this example, any action from the user is either positive (exists on the solution path) or negative (does not exist on the solution path) and the system reacts to each user step outside the solution-path, an approach called *model-tracing* (Anderson, 1993).

Social skills exercises may have any number of solutions and have to allow for a wider freedom of exploration: some user action may not be either positive nor negative in the scope of the scenario and the proposed learning goals.

For example, in a *first customer meeting* scenario the goal may be to train users to make a summary of the

discussion at the end of the dialogue. All other interactions of the user with the system that do not contradict this goal are thus not errors. The scenario may have two goals - "make summary" and "present your company to the client", or a third goal "ask about the client's company", but there can still be any number of user actions that do not trigger any goals yet are not errors.

The proposed model gives the decision to the scenario designer (Figure 1) who can select any number of goals for the scenario, group them into sets and order the sets. The sets are relevant to hold goals that may be achieved in any order, yet ordering the sets allows ordering the groups of goals. Figure 2 shows an example of three goal sets organizing four goals: this example implies that G1 must always be achieved first, there is no order between G2 and G3 which have to be achieved before G4.



Goal reiteration

The proposed model is able to use goals re-iteratively, when this is necessary. In the example from Figure2, all the goals should only be achieved once. However, in a simple feedback scenario where the user has the goal to provide feedback to an employee, the same goal would be achieved after every feedback given. The designer can choose to have either a fixed number of iterations, or an unlimited one for each goal.

Reinforcement and corrective feedback

A social skills tutor has to provide the user with both positive feedback, reinforcing good behavior patterns and remedial feedback to correct negative behavior patterns. There are three steps by which the correct feedback is chosen:

- if the current goal is from the wrong set, ie., there is a goal not yet achieved in a lower set, a *order_error* message is prompted indicating there should have been some previous actions;
- if the current goal is on the correct level, but it's iteration number has been passed, a *number_error* message is prompted, indicating the goal was already achieved;
- if the goal's criteria set *decides* that the behavior was positive, a *success_message* is prompted to the users, if not a *content_error* message indicates the reason why the predefined criteria consider the behavior to be negative.

A special type of goal is also implemented called a "buggy goal", which when triggered always prompts an error message. These are meant to capture frequent errors, between the triggering of regular goals. To explain this, consider the goal "say hello" (Figure2). If the first user action is not a greeting but also does not trigger any goals, the user would not get a remedial message. A buggy goal "always say hello first" that is triggered by all actions except the ones in the existing goals captures such behavior.

The expert model

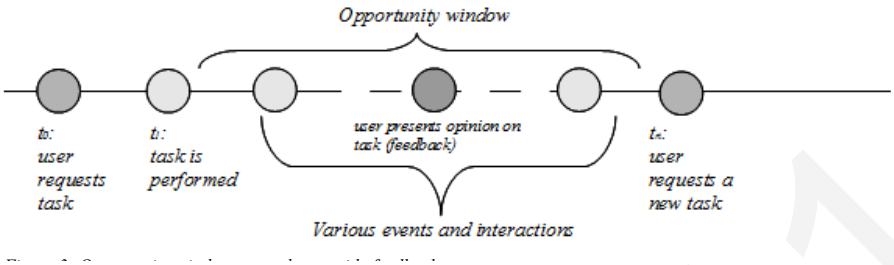
An ITS expert model is in charge of knowledge representation; in model-tracing tutors this is implemented using production rules "IF... THEN..." rules – that match conditions with facts in the system and execute when the conditions are met. (Edwards, 1991). For the social skills tutor, the criteria based on which the goals decide "positive" vs "negative" are also represented through production rules, but in a customized approach.

Firstly, there are two types of criteria – simple and complex. The simple criteria relate to actions that are completed in a single interaction: for example the sentence "Hello", this satisfies the criteria "Say hello" and the sentence "Our company has ten years of experience" satisfies the criteria "present your company to the client". It should be noted that this paper does not deal with the complexities of natural language processing and the underlying assumption is that the user's input is already mapped to a desired meaning.

The complex criteria are based on actions that may take more user-system interactions to complete, such as "provide feedback". A user sentence such as "you did great work" is not sufficient to satisfy this criteria: it must also be in a correct sequence (eg., it needs to follow an action from a simulated character).

To address this issue, two components have been developed: a History that records all system events, to provide a time-line of events (including but not limited to user actions) and a mechanism to activate and deactivate the rules according to predefined conditions called *opportunity window*.

Figure 3 illustrates the opportunity window for the example "provide feedback" considering this simple principle: the feedback on a performed task must come before another task is requested of the employee.

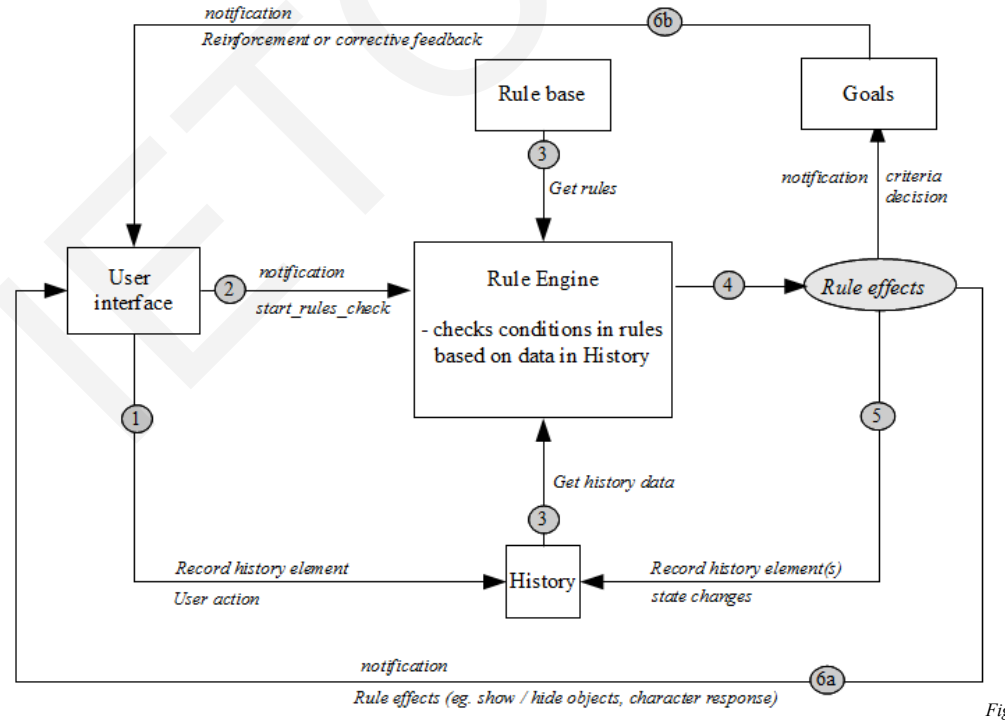


Designing production rules that will match the facts inside opportunity windows, change the "IF... THEN..." paradigm (based on one condition) to a three-condition paradigm: :

(R1) IF *start_of_opportunity_condition* THEN *activate_rule*
IF *fulfillment_condition* THEN *execute_rule_action*
IF *end_of_opportunity_condition* THEN *deactivate_rule*

Although the expression R1 seems similar to the expression "IF *start_of_opportunity_condition* AND *fulfillment_condition* THEN execute-rule-action" (R2), the two are in fact different due to one important point: processing of the three conditions in the proposed model may be done in completely distinct phases, that have different facts in the History. A rule of form R1 may be activated at a moment t_l and then executed at a moment T_k even if at moment T_k, the activation condition is no longer true. In R2, the rule executes only if the activation condition and the fulfillment condition are true at the same moment t.

Figure 4 illustrates the connections between the History, the rule engine (evaluating the criteria for the goals) and the goal module.



Figure

INITIAL STUDY

To better understand the way users would interact with the application in general and the feedback module in particular, an initial formative study has been performed.

The study consisted in two groups of 10 students using a scenario with the goal to attend a first customer meeting. The first group played the scenario without any feedback, while the second group was given feedback according to the above model.

More learning goals have been set in the goal layer: “Say hello”, “Present your own company”, “Ask for information”, “Make discussion summary”. To keep the study as simple as possible, the study has been focused on the second goal. Thus a metric P_{err} = 'Present company errors' has been defined to see how many users *forget* to present their own company. A secondary metric has been set up for the feedback group – P_{rev} = “present company review”, to show if students receiving a feedback to present their own company immediately act upon this feedback.

The study found that P_{err} was very similar for both groups: none of the students form the feedback group presented their company on their own and only one of the students in the control group. This metric performed as expected, showing that there was no significant difference between the two user-groups.

About P_{rev}, the study found that 8 out of 10 people receiving the feedback, immediately acted upon it, presenting their company as soon as the feedback module indicated that. Observation shown that the other two users were too focused on the dialogue and payed no attention to the feedback window.

Other observations have been made to complete the initial study:

- the implemented feedback module reacts to the user's actions but does not provide pre-action hints; some users have shown to be confused as to what they should do next;
- some users have shown confusion with the feedback messages received; for instance, reinforcement feedback such as “you achieved the goal X” was prompted by three of the students by a new attempt to perform the action X.
- the interface itself has been confusing for some of the users that could not express all their intents using the menu-based input; this may affect their behavior as some could browse through the available options and choose any of them randomly, without having a communication intent of their own. This hypothesis needs further testing and is so far the most important limitation of the proposed system.

CONCLUSIONS AND FUTURE WORK

The current paper showed a new approach for Intelligent Tutoring Systems that could be applied to social skills, an ill-defined domain based on communication. The main claim is that such a system can help train user's behavior by letting them “rehearse” different simulations of social interaction and by providing feedback to reinforce predefined good behavior and to correct negative behavior.

It is also argued that the “administrator” or “designer” should have an important role, by creating the simulations – the virtual worlds with specific objects and simulated characters, but also by defining good / bad patterns of behavior and setting up the learning goals and the appropriate feedback.

The initial study shows the potential of the approach, as most users immediately acted upon the feedback received from the system. There are some important limitations as well, the most important one being so far the confusion generated by the menu-based input system. A natural language processing module should thus be the focus of further research.

Further work will also imply a continuation of the initial user study, to better understand the users' reaction to the system and in particular to test if the “temporal generalization” principle is met, ie., verify if the behavior change is maintained over time.

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TRAINING OF SURGERY FOR A STUDENTS AND PREPARATION OF SURGEONS-INTERNS USING MEDICAL SIMULATORS

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ABSTRACT

Taking into account that the level of qualification of the doctor is in the first place in various gradational system of educational societies it's understood the necessity to improve the quality of the doctor in institutes of higher education, in which directed implementation of the credit-module system to the educational process. This requires to reconstruct the process of teaching surgery both students and medical interns towards a positive effect - mastering the full range of theoretical knowledge and practical skills with the help of modern equipment.
Received results underscore the increased objectivity in the control of knowledge on the part of teachers' interest and increasing students and medical interns' interest to master a subject, that allowed to prepare a general practitioner in surgery and surgeons, and integrate in the future in practical public health in Ukraine and worldwide.

INTRODUCTION

Taking into account that the level of qualification of the doctor is in the first place in various gradational system of educational societies it's understood the necessity to improve the quality of the doctor in institutes of higher education, in which directed implementation of the credit-module system to the educational process [2-3, 5, 13-14]. Preparation of doctor's of the general practice is the principal task of the medical institution of higher education, and therefore the proper teaching of surgery in the whole complex of other disciplines will create conditions for quality medical practice doctor in the future, especially for those professionals who plan to work as surgeons.
The doctor's of the general medical practice tasks determinates basic requirements of scope of knowledge and practical skills for graduating student of institute of higher education of IV level of accreditation: goal-directed methodic algorithm of questioning of the patient (getting anamnesis), physical examination, substantiation of provisional diagnosis, determinate algorithm of additional methods of investigations with analysis of received results, differential diagnosis, forming clinical diagnosis, substantiation of treatment program and it's implementation [4, 6-7]. And for the intern surgeon it's important to mastering of surgical manipulation and stages of surgical interventions in treating the most common surgical diseases or providing an emergency assistance in case of emergency conditions. Development of modern surgery is impossible without modern techniques, including laparoscopic technology, so it's necessary to prepare medical interns to work on equipment that meets the time.
This requires to reconstruct the process of teaching surgery both students and medical interns towards a positive effect - mastering the full range of theoretical knowledge and practical skills with the help of modern equipment.

METHODS AND PROCEDURES

The aim of the study.
To implement the system of planning, monitoring and evaluation of the education quality for a real degree of assimilation of students with specific components of the program during the academic year of surgery training and discipline for module "Abdominal surgery" in general based on the cumulative number of ranking points for the European Credit Transfer System (ECTS) [1-4, 8-12]. This will improve the quality of learning discipline among the four-year students of enrolled this year, and develop common indicators for professionally-oriented exam after 6 year of study to get a general level of theoretical and practical knowledge and skills of physicians interns of surgery.
Object and methods of investigation.
The Department of Surgery № 1 of the Dnipropetrovs'k State Medical Academy was conduct structured, multiple planning of the study process and the use of different forms of the staging control. Taking into account the Standard program of the discipline, curriculum, Working program for the department was

create the specific actions by teachers, students and interns of surgery to achieve theoretical and practical knowledge, necessary resources and sequence of technological operations with the use of credit-modular system [1].
Thus, there were additionally created classes for training with medical mannequin and simulators to master the practical skills of students in educational time and time for self preparation on products firm "3B Scientific".
Was founded Ukraine's first training center "Endoscopic technologies in medicine", bases on which interns learn to use mini invasive operating technologies in surgery. This center was open thanks to involving special training and instruments of the company "Karl Storz-Endoscope" and "Ethicon Endosurgery" (subsection "Ethicon a Johnson and Johnson Company").
Nosological principle of training that exists in most clinical departments, unfortunately, does not meet the practical work of a doctor, so we came to forming the curriculum by the syndrome principle: a practical training combines several pathological conditions, with oriental features, such as the module "Abdominal surgery", consists of two modules of content (substantial modules): "Urgent abdominal surgery" and "Surgical Gastroenterology and Proctology".
Thus, the substantial module "Surgical Gastroenterology and Proctology" includes "Syndrome of chronic pain in the upper region of abdominal cavity", "Syndrome of mechanical jaundice", "Syndrome of an acute pain in perianal area", "Syndrome of rectal prolepses" and "Diarrheic-inflammatory syndrome", combining similar diseases or their complications in the form of so-called educational elements, where, for example, a practice training for "Syndrome acute pain in perianal region" contains "Acute hemorrhoids", "Acute anal fissures", "Acute paraproctitis" and "Inflammation of the epithelial coccygeal passage".
This approach is appropriate to expediently use the time of practical training, examine patients according to pathological syndrome, mastering the skills in classes with medical simulators, perform differential diagnosis with the definition of a rational treatment program.
To support the learning process developed by the principles of credit-modular system using multimedia lectures, the textbook "Surgery" in 3 volumes (5 books) [6], methodological guide of development for students and interns, methodological guide of development for teachers, hand book and individual plans for students and interns, journal of the teacher.
For the practical training used division's computer class (10 computers) - for computer testing of students and interns, two classes of medical mannequins and simulators (products firm "3B Scientific") - for acquiring and mastering practical skills, supervision of patients in the surgical department, supervised and theoretical survey in training rooms.
For the interns besides the basic work in the surgical department with patients it's necessary to mastery of the operational equipment in operation and manipulation rooms, as well as mastering of mini invasive surgery technology in the learning center "Endoscopic technologies in medicine".
The algorithm of training and preparation on surgery of students of 4th course on practical studies (2 hours 40 minutes):
1. Muster, the announcement of a theme and the purpose of practical studies - 5 minutes;
2. Carrying out of theoretical computer testing on an studies theme in a computer class of chair (30 tests for 30 seconds on everyone students) - to 15 minutes;
3. Control of the mastered two concrete practical skills on an studies theme on simulators and firm training apparatus "3B Scientific" - to 50 minutes;
4. Investigation the thematic patient in surgical division of clinic after development of practical skills on simulators and firm training apparatus "3B Scientific" - to 30 minutes;
5. Theoretical analysis of results investigation the thematic patient and a theme of study with poll of each student - to 50 minutes;
6. Analysis of the basic errors admitted by students - 5 minutes;
7. The information on the task on preparation for following practical studies - 5 minutes.
After each study to students time for independent development of practical skills by preparation for following study is allocated.
The algorithm of training and preparation on surgery of surgeons-interns on practical studies (8 hours):
1. Muster, the announcement of a theme and the purpose of practical studies - 5 minutes;
2. Work in surgical division on inspection of patients, participation in medical and diagnostic manipulations, on operations - 4 hours;
3. Theoretical analysis of a theme of study – 50 minutes;
4. Development of practical skills of performance of medical and diagnostic manipulations on firm "3B

Scientific" productions - 1 hour;
5. Development of practical skills of performance surgical, including, laparoscopy operations in a special class of firms "Karl Storz-Endoscope" and "Ethicon Endosurgery" (subsection "Ethicon a Johnson and Johnson Company") - 1 hour;
6. The information on the task on preparation for following practical studies - 5 minutes.

RESULTS

Experience of using credit-modular system in teaching and measuring knowledge of surgery since 2005 suggests that this approach is effective.
Received results underscore the increased objectivity in the control of knowledge on the part of teachers' interest and increasing students and medical interns' interest to master a subject, that allowed to prepare a general practitioner in surgery and surgeons, and integrate in the future in practical public health in Ukraine and worldwide.

CONCLUSION

It is necessary the cooperation of the educational institution, clinical department and companies - manufacturers of medical and educational equipment, as in our case, working with "3B Scientific" and "Karl Storz-Endoscope", "Ethicon Endosurgery" (subsection "Ethicon a Johnson and Johnson Company").
Use of medical simulators and training mannequins for acquiring practical skills and new technologies of operative interventions using modern endoscopic equipment, tools, and simulators allows to imitate the real clinical situation during operative interventions and learn steps to resolve it. As illustrated by the medical literature, the main errors in the operative interventions falls on the first 30-40 operations. That's why the working out of these first surgical interventions should be conducted on medical simulators for the purpose of reduce the risk of mistakes in the future.

ACKNOWLEDGEMENTS

We wish to gratefully acknowledge the advice and support of representatives "3B Scientific" and "Karl Storz-Endoscope", "Ethicon Endosurgery" (subsection "Ethicon a Johnson and Johnson Company") in the preparation of our work and this text.

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TRANSFORMING TECHNOLOGY INTO EDUCATIONAL PRACTICE: CONTENT DESIGNING PROCESS OF LEARNING OBJECTS

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ABSTRACT

In recent years, especially as reflections of the developments in computer technologies, essential changes toward practicing technology based instruction in educational curriculum are realized and teachers' use of technology is getting more important. Providing teachers' requirements about computer based learning objects they can use in classrooms is needed for both using the curriculum and increasing learning levels of the students. In this context, the purpose of this study is to represent examples from designing and constructing process of the some selected experiments which are designed by using simulation based learning objects of physics, chemistry and biology subjects taking place in Science and Technology Laboratory Practices II lesson that is taught in second class level of department of classroom teacher. The learning objects are designed by using Adobe Flash software. During the designing process, the experts about computer and instructional technologies, graphics designing, physics, chemistry and biology are included. Beside, two and three dimensional graphics, audio, text and animations are used while designing experiment simulations as learning objects. During the process of organizing the contents of experiments and designing the learning objects, technological pedagogical content knowledge (TPCK) and cognitive load theory (CLT) are taken into consideration for providing students flexible and practical learning objects directing them to learn by discovery.

Keywords: Simulation, learning object, technology based learning content, instructional technology.

INTRODUCTION

Due to the progress of information and computer technology development, e-learning is emerging as the paradigm of modern education environments (Sun, Tsai, Finger, Chen, & Yeh, 2010). These days, digital media have enriched the teaching and learning experiences and have become commonplace with students and teachers (Engelbrecht & 2005; Liaw, Huang, & Chen, 2007). E-learning requires providing experiences to support the educational process and during this process using information and communication technologies are needed (Davis & Wong, 2007; Selim Ahmed, 2010). Thus e-learning is rapidly increasing as a basic vehicle carrying instructional activities to the higher levels.

All these developments are featuring the constructing and practicing process of e-learning which may be defined as the reflection of technology into the education. From this point of view, educational programmes, teacher and student characteristics, learning environment and the learning objects to be used in this environment are so important. The use of technology in educational environments plays a key role for planning process which is realized toward educational reformation of educational programmes, especially teacher training programmes (Angeli & Valanides, 2009; Dawson, Pringle & Adams, 2003; International Society for Technology in Education-ISTE, 2002; Thompson, Schmidt & Davis, 2003).

Putting the e-learning into practice is possible by training the teachers as technology users. International Society for Technology in Education (ISTE) determines new technology standards for students and teachers. Teachers may use the technology and its materials for education and instruction according to these standards. These technologies are also defined as basic elements connecting the academic objectives and content for learning process (ISTE, 2000a, p.17). Using the technology and content in a proper pedagogy is needed for e-learning environments supporting teaching and learning. Beside, student characteristics should be taken into consideration for designing the e-learning process. Because student centered design is required for learning deeply (Biggs, 1999; Ramsden, 2003; Smyth, 2011). To realize this design, technology should be used as an assistant element for pedagogy instead of applying the pedagogy directly and the learning process should be taken under control by the student.

Thus teacher should think of the answer of the question "Which material should I use for better learning?".

According to constructivism, teacher is supposed to be a guide and designer supporting student to construct information by themselves instead of presenting the learning subjects directly to students (Smyth, 2011). This situation features the learning object concept. The concept of learning subject aims to provide and ease the use of teaching experiences, pedagogical knowledge and educational sources (Carey & Hanley, 2008; Klebl, Krämer, & Zobel, 2010). If the technology is used effectively to create learning objects and serviced for the teacher use, new opportunities may be provided them to apply the constructivism. Activity theory emphasizes the importance of using the learning content and digital technology together for teachers and students (Stevenson, 2008). The theory states that by this way a frame for designing learning environments can be created and the power of digital technology can be used.

Teaching with technology is related to technological pedagogical content knowledge (TPCK) and may be defined as the whole structure of technology-pedagogy-content elements (Karamarski & Michalsky, 2010). Koehler, Mishra and Yahya (2007) stated that the heart of TPCK includes an operational and changeable structure formed by the connection of the technology-pedagogy-content. Archambault and Barnett (2010) show the deficiencies about how technology-pedagogy-content elements would be integrated for TPCK as a whole structure. Similarly Koehler, Mishra and Yahya (2007) state that there is no clear sources to answer the question of how technological knowledge would be constructed, used and presented by emphasizing TPCK.

According to Klebl, Krämer and Zobel (2010) reusable educational sources such as learning objects should have three basic characteristics. These are flexibility, content and pedagogical expertness. In this context, theorical approaches about the designing and developing process of learning objects should be taken into consideration. Curriculum development process and its characteristics can be taken into consideration during this process. Because learning objects developing process is like curriculum developing process. Five basic elements of curriculum development process should be paid attention: Needs, objectives, content, teaching-learning process, measuring-evaluation process (Prideaux, 2007). A successful program designing process requires a long-term and cooperative study (Williams, et al., 2009). Lunenberg (2002) explains some of the steps of this process as formulating objectives, analyzing content, organizing the designing process and determining the roles of the experts who take place in this process.

Angeli and Valanides (2005; 2009), Efendioglu and Yelken (2010), Mishra and Koehler (2006) and Niess (2005) stress the integration of theorical and conceptual structure of technology into the teaching-learning process as one of the weaknesses of instructional technology area. In this context, putting forward the application samples from the steps of technology based content organizing process which are used for creating learning objects is accepted as important.

PURPOSE

The purpose of this study is to introduce the development process of computer based simulations-learning objects and the structure of learning objects.

METHOD

The structure of working group in which the experts are included for the development process of learning objects, development steps and samples are given in this section.

Structure of Working Group

Learning objects development process is same as curriculum development process. So during this process five different experts of computer and instructional technology, physics, chemistry, biology and graphic design were included in working group.

Learning Object: Computer Based Simulation (CBS) Development Process

Following steps were carried out during the development and designing process of learning objects (computer based simulation-CBS) which were separately developed for 20 different experiments in science and technology laboratory practices-II (STLP) lesson.

Step 1: Determining the Objectives and Content Designing Process of CBS

Objectives of each lesson were determined by computer and instructional technology and subject area experts. Contents of experiments were reviewed and required arrangements were done. Following these

process computer and instructional technology and subject area experts developed a rough CBS in which the steps of experiments were included visually.

Step 2: Visual and Instructional Design

In the rough which had been prepared in former step required arrangements were done by computer and instructional technology and subject area experts. It was decided that the visual objects included two and three dimensions. Also scene settings of CBS were organized. The visuals to be included in each scene were prepared by graphic design expert by using 3D-Studio Max software. Computer and instructional technology expert completed the CBS design process by using the prepared visuals in Adobe Flash CS5 software.

Step 3: Evaluation of CBS

CBS design was tested by subject area expert on computer. Deficiencies and problems were reported on a form. According to this report, computer and instructional technology expert made corrections and changes on CBS and completed it as final situation.

Two Samples of CBS

Sample 1: Dynamo Experiment

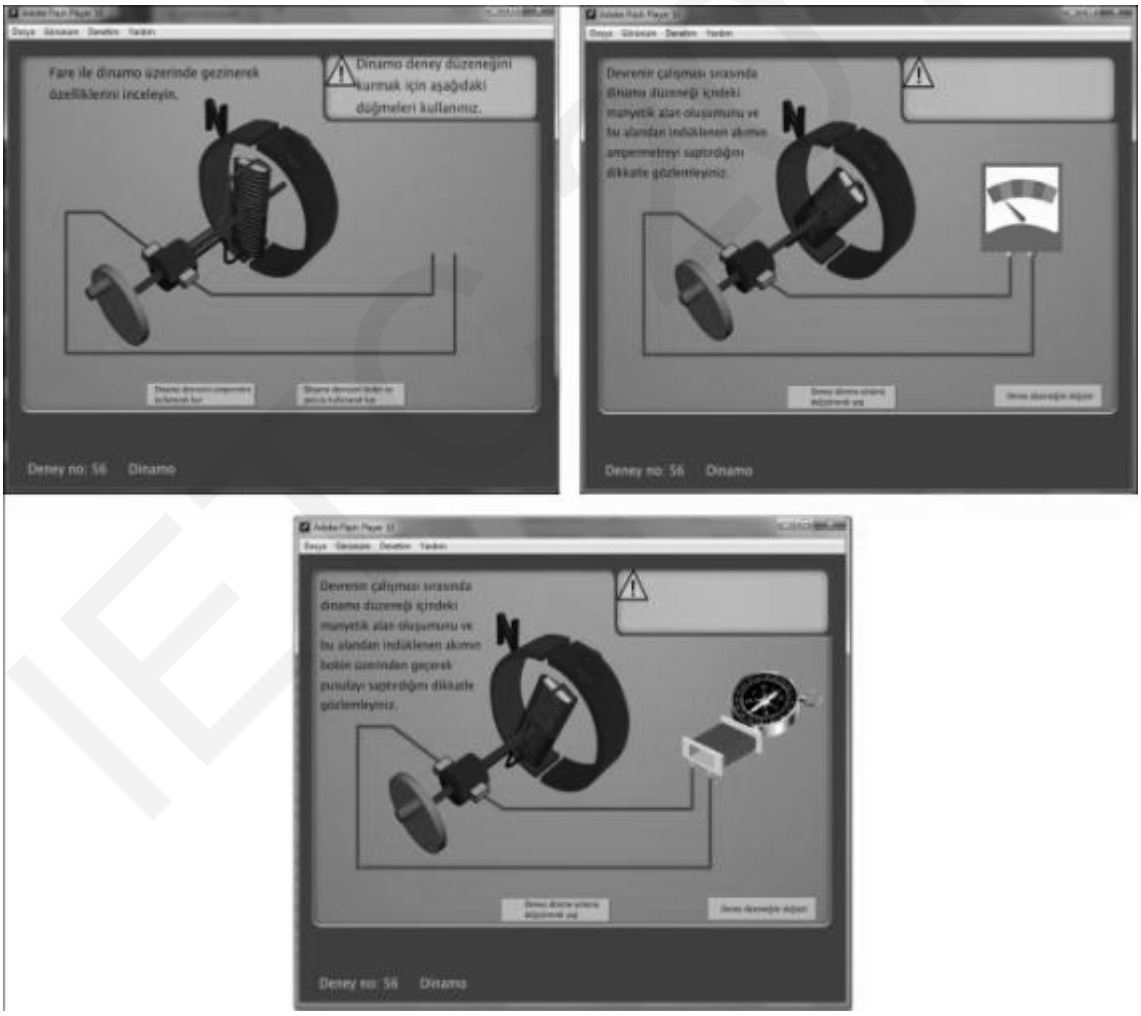

Figure 1. Screenshots of Dynamo Experiment

The purpose of dynamo experiment is to understand the structure of dynamo, its working principles and to test it. Students may learn the function of structures included in dynamo mechanisms by

using this CBS. Different dynamo circuits may be designed and worked and real time tests can be done for the results. Students can stop the working dynamo and can pass to another mechanism whenever they want. All the specifications and circuit works can be repeated, so the retention of the knowledge is provided.

Sample 2: Shadow and Penumbra Experiment

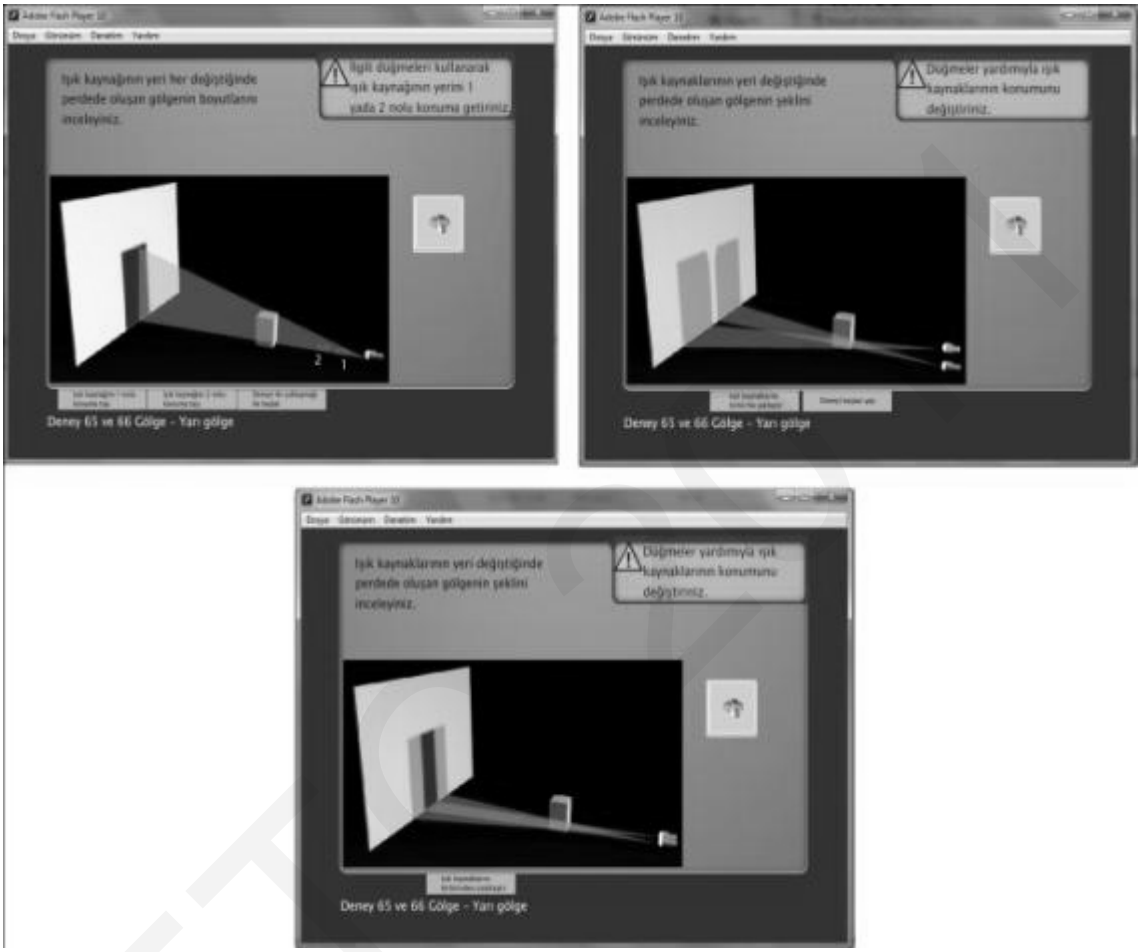

Figure 2. Screenshots of Shadow and Penumbra Experiment

The purpose of the experiment about shadow and penumbra is to help students to understand characteristics of shadow and penumbra. Students may recognize the characteristics of the materials which are used in experiments. Also they can use different characteristics and observe the results real timely. They can repeat these activities, and by this way fill the learning gaps and gain permanent knowledge. They can decide about the mathematical linkages between the light source, object and shadow by benefiting from the facilities of visual objects.

CONCLUSION and DISCUSSION

Learning objects are needed because of the requirements for regulating the learning environments effectively. Boyle (2010) states that learning objects should be accepted as the elements of learning design. This paper describes the characteristics, development steps and importance of learning objects by presenting them via a sample of CBS. The present paper especially proposes the use of learning objects to enhance the cognitive and affective development of students. In literature, evidences supporting this idea are found. The increase of the interaction of students with the learning objects in learning environments contributes the rise of students' academic achievements (Bower & Hedberg, 2010; La Pointe & Gunawarndena, 2004). According to Baki and Cakiroglu (2010), the attitudes and approaches of students are generally positive toward the use of learning objects and they find the learning

objects as effective learning tools. Hoe and Woods (2010) describe the learning objects as an alternative approach enabling learners to control their own learning. Students are positive about the learning benefits, quality, engagement values and motivation of learning objects. By this way their academic achievements are increasing by the use of learning objects (Cameron & Bennett, 2010; Kay & Knaak, 2008). Studies show that the learning objects are effective not only for students but also for teachers. Teachers' attitudes are positive about the use of learning objects and learning objects increase their motivation for lessons (Cameron & Bennett, 2010; Kay & Knaak, 2008). When these results are taken into consideration, we propose the development and use of learning objects as effective learning tools.

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TRANSFORMING THE EDUCATION IN INTERNATIONAL MARKEING FROM TRADITIONAL TRAINING TO PARTIAL SELF-TRAINING WITH INSTRUCTOR'S HELP USING OPEN SOURCE SOFTWARE: THE EXPERIENCE OF BURGAS FREE UNIVERSITY

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This paper is an attempt to present the work of a team of lecturers and students on a project named "Development of an electronic course in International Marketing". The first part presents the theoretical background - epistemology, methods of IT application, Moodle e-learning environment. The second part discusses the motivation for the decision to direct students' activities through the electronic channel, as well as the practical algorithm of work and the sequence of actions. The last section focuses on the practical results of the project, the achievements, the shortcomings and the possible ways of removal.

"I heard and I forgot, I saw and I remembered, I did and I understood."
Confucius

INTRODUCTION

This report presents the work on the project named "Development of an electronic course in International Marketing", funded by the University Research Fund of Burgas Free University. The project was conducted in the period 01.02.2010 - 10.11.2010 by a team of teachers and students. Writing this report, we fulfill the obligation to present the methodology and promote it participating in conferences and seminars.

Before the start of this project, the course in International Marketing was led in the traditional way with a combination of lectures (20 hours), seminars (10 hours) and development of a project on a given topic. Due to the nature of the written work, which is an export plan of a company, the limited seminar classes were mainly used for consultations on the students' problems with task. The checking of the written texts was carried out in consultation hours out of the training schedule, which benefited a limited number of students and the papers were sent by e-mail or had to be printed in order to be checked. For years, the attempts to intensify the students' individual work were giving poor results and depended on factors related to motivation, education, and working habits built by high school. The decision to change the methodology and to upload the training materials on the Moodle platform complies on the one hand with the policy of the Faculty of Business Studies, on the other hand with the aim to remove formal barriers to motivation and to encourage self-training of students. Since the change was made in the interest of students, together with the satisfaction of the accepted educational standards, the views of the students from the project team had been taken as a corrective all the time regarding the requirements for understanding, comfort, simplicity of education and communication. As the use of computer technology in the learning process can stimulate and maintain student's motivation, promote self-organized learning and encourage group training, the e-course was expected to create working conditions as close as possible to the conditions in the marketing structures of the companies.

THEORETICAL BACKGROUND – EPISTEMOLOGY, METHODS OF IT APPLICATION, MOODLE E-LEARNING ENVIRONMENT

The constructivist theories of learning are the most widespread trends in contemporary theory of learning [4]. Prominent pedagogues and psychologists, Jean Piaget, Jerome Bruner, and Lev Vygotsky among them, are their supporters and advocates. The constructivist theories of learning are divided into several groups:

• *Trivial constructivism*. Knowledge is constructed actively by the learner, not passively received from the environment.

• *Radical constructivism*. Obtaining knowledge is a process of dynamic adaptation in respect of feasible interpretations of experience. The emphasis here is on the individual learner as a constructor of knowledge.

• *Social constructivism*. Knowledge is complete, when the students share and discuss with others learning achievements.

• *Cultural constructivism*. Learning is related to the specificity of the cultural environment in which the knowledge will be applied.

The electronic course in International Marketing BFU seeks a combination of social and cultural constructivism, as far as the marketing activity combines social and cultural aspects.

The model of learning based on the constructivist theories involves the use of didactic methods such as project work, discussions, problem solving, experimentation, research, literature exploration, linking theory and practice [1]. The technological tools applied in e-learning (e-mail, discussion forums, group education systems, integrated systems for e-learning) are a prerequisite for the realization of the constructivist training model. Five main methods of using information technology in teaching and learning are known:

• *Support method*. Technology is used for increasing accuracy and performance of work. Such tools are word processing packages, auxiliary programs for engineering and design.

• *Method of investigation and control*. The main tools are software packages, through which the students can study, explore, experiment and build solutions.

• *Management method*. The information is provided by the teacher at an appropriate level and pace, allowing for feedback on progress in training.

• *Resource method*. Technology is used to access information and other resources online.

• *Connection method*. Technologies are used for communication between the individuals. Examples are the electronic mail and video conferencing.

In modern development integration of functional characteristics of the different methods is observed. Today there are many different technologies that can be used for e-learning with the Internet. The Web-based learning can be described as a study in which the Web is used as a virtual environment for the presentation of learning materials and/or for carrying out the learning process [1]. It may be in two forms - to support regular training or to completely replace a course taught in the audience. In such courses the learners play a central role and are given the opportunity to learn at their own pace. Another feature of these courses, which distinguishes them from other types of training courses, is the possibility of communication between students and teachers and among students. In the courses and e-learning systems based on constructivist theories, the emphasis is placed on activities entailing new knowledge self-constructing – problem-solving, experiments in a simulation environment, project work, group education, participation in discussions. In most cases there is no separation between lectures and seminars, the course structure is hierarchical, often based on a modular approach. A typical course includes:

• G*eneral description of the course* - objectives, organization, curriculum guidelines for use of the various structural components of the course - recommended sequence through the curriculum and activities, announcements and discussion forum relating to the whole course, links to other similar courses, further reading;

• *Preliminary test* to establish the starting level, if necessary;

• *Modules (topics, subtopics)*, each of which may include learning objectives, a preliminary test, course content delivered in various formats, discussions relating to the curriculum, simulation programs, assignments (individual or group) that are carried out or transmitted online, assignments made and transmitted out of the system for e-learning, test to check knowledge and skills after passing through the structural element (module, topic, subtopic), literature and links to other useful sources concerning the current structural component of the course;

• *Final test*.

The main didactic methods that can be implemented in e-learning are interactive methods [5]. The essence of the dialog (interactive) learning methods is limited to the relationship between questions and

answers that in the training process can be drawn from both the teacher and students. The main types of the dialog methods are:

• *Discussion* - exchange of views and ideas within the theme to achieve greater clarity and deeper knowledge;

• *Interactive simulation* - a method that uses technological means to study an object or process;

• *Problem solving and bottleneck resolving* - methods directed to practical training and common elements in e-learning courses, especially when the course is based on the constructivist theories of learning;

• *Project work* - a method that is implemented in e-learning through the use of information resources available on the Internet to carry out an examination;

• *Exercise* - deliberate repetition of a certain action to develop skills and habits according to a standard;

• *Methods for monitoring and assessment of knowledge* - testing, solving practical problems, project work, portfolio that includes a systematic collection of the student's work [2].

The electronic course in International Marketing in BFU is concentrated around the implementation of the last three methods in combination with discussion and problem solving within the offline seminars.

"Learning by doing", one of the main principles of constructivism, is embedded in the pedagogical model of the open source e-learning environment named Moodle (Modular Object-Oriented Dynamic Learning Environment) [3, 6]. The platform as a system for e-learning makes possible the realization of the following basic elements and functions:

• Registration and cancellation of students who are supposed to pass the training course;

• Publication of any text and illustrative materials;

• Seeking feedback through surveys;

• Preparation of examination materials;

• Giving assignments for course projects and providing sources of information online;

• Application of different means of evaluation;

• Discussion forums;

• Messaging;

• E-mailing.

Moodle supports three different course formats: weekly, thematic and social. The content and training activities may be added in the order in which they will be used by the trainees. The resource module contains mainly web pages and other documents. It allows loading of external information such as Power Point presentations, since it has an interface that supports this feature. By the users' registration the trainer can trace the work of each student.

The advantages of Moodle are: coordination of people, resources and activities; monitoring of the training; self-organization of the students; adaptability of the modules and systems.

We chose Moodle as electronic environment because the platform is free for use, distribution and development. It has a simple interface translated in Bulgarian. With regard to the particular course it makes possible the provision of theoretical information and instructions for practical work which can be used without the simultaneous presence of the lecturer and the students in the auditorium. Furthermore, the electronic course allows coordination of efforts in several directions - between the lecturer and the students, among the students who work together in teams and consultation between the different teams.

The possibility to organize online meetings at a specific time in which to conduct group and/or individual consultations, the results of which are visible to everyone at the moment or at convenient time, was also an important factor for choosing the platform. Here we should note that the system is currently used by the students of Burgas Free University and it is available at the address http://students.bfu.bg/moodle. The students can work from their personal computers anywhere in the university. Places for work are also provided in the reading rooms of the university library.

METHODS AND PROCEDURES

With the creation of the electronic course in International Marketing we set the following goals:

• to develop a training methodology for the International Marketing course in an electronic environment in terms of the idea to allow for maximum autonomy and independence of students in both theoretical and practical aspects;

• to develop the multimedia content of the course materials with an emphasis on independent learning, self assessment and course-project work on real data;

• to motivate the students with good projects to present their achievements in conferences and seminars.

The idea of the project was to enable students' self-training while timely updating the educational materials in conformity with the continuously changing market environment. By creating this e-course we respond to the requirement of the Lisbon Strategy to expand the share of modern methods for management of training. The practical task of developing an export plan aimed to build skills and competence to apply theoretical knowledge in particular cases closer to the actual market conditions. The envisaged electronic version of the manual *"Guidelines for Developing an Export Plan"* allows supplementing, updating and testing of lists of electronic data sources (the export plan is developed on the basis of information from active sites of companies, the European Commission, websites of ministries, international databases).

The uploaded materials provide an opportunity for the marketing graduates as guest users of the database to follow the latest developments in export planning in the context of the Single European Market and the realization of the idea of lifelong learning.

The work on the project proceeded in the following order:

1. Overview of the existing methods and learning materials available

2. Study of literary and accessible via the Internet materials on the subject

3. Development of presentations of the topics from the approved course curriculum as reference materials accompanying the textbook

4. Development of materials for self-training

5. Updating the existing manual and template for the development of the course project

6. Preparation and publication of the manual

7. Uploading and testing of the educational materials for the e-course in the system

The course was organized by topics and each topic was presented with a plan of the main theoretical issues included in it. In addition to the PowerPoint presentations on the theoretical textbook chapters other useful materials are added, such as exercises, short self-tests, copies of legal documents, word files with hypertext links to web pages containing additional teaching materials, research results, legal libraries, case studies. All documents can be used online or downloaded. Some of the exercises and case studies are used in the seminars and in these cases the students have an obligation to print them in advance.

Since the primary aim of the project was to encourage the independent work of the students, the greatest attention was devoted to the preparation of the materials for the course project called "Plan of ... (company) for export of ... (product or product line) to the market of ... (member state of the EU). Creating a plan, though training is a complex, labour intensive, time consuming job and requires special efforts as regards the creation of teams, the allocation of roles and responsibilities in them and the right choice of a company, market and specific product for export. For this purpose, in the preparatory stage of the project we developed appropriate support materials to maximally facilitate the training and provide an algorithm of work and evaluation. To avoid repetition of the instructions by the lecturer and the students to be able to receive a constant source of organizational support and consultation at any time we developed the manual *"Guidelines for Developing an Export Plan"* and it was uploaded in a separate topic of the e-course. The manual was issued as a book as well and could be purchased or used in the library. As an application to the manual we developed a template containing the structural parts of the plan and specific instructions on the places that would embarrass the students. At the beginning of the

template we put a list of hypertext links to company sites, legal libraries, addresses of European institutions, Bulgarian ministries and NGOs, research agencies and electronic databases for which Burgas Free University has been subscribed. The template and the manual are supposed to be used in parallel and the relations between their parts are visible through the numbering, but nevertheless we also provided a system of signs that forward the students from one to the other document and information sources. The template was uploaded to same topic. It was recorded on CDs and attached to the manual in book format.

In the same Topic we uploaded two examples of projects given high ratings in previous years, and a sample test for the exam. The exam in International Marketing is conducted in two parts - solving a theoretical test and presentation of the project.

The development of the course ended in early October, after which in the first seminar classes for the semester the enrollment organization was established. In general the students supposed to pass a course register on the website with their faculty number, but in this case it was not necessary because they had passed other courses in electronic format.

The main page of the course is presented in Fig. 2.

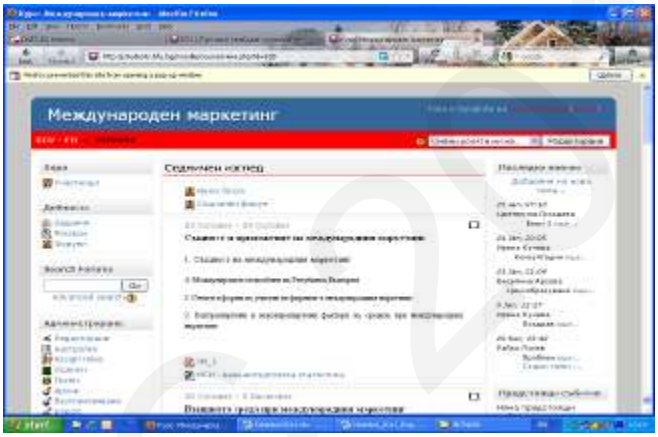

Figure 2. The main page of the course

Upon completion of the lecture course in seminar classes teams were created, each consisting of three students, and each team was given a deadline to decide on the company, the product and the market. After the final decision in the module "Assignment" we published the lists of the teams and their specific tasks. The students were expected to download or use online the manual and to download the template and start filling it. After completing the work up to a pre-scheduled stage the template had to be uploaded into checking system. The lecturer had to check the uploaded papers in the order of receiving and return them back to the teams' pages to continue working on them. The system was configured so that it assumed an unlimited number of corrected returned templates. The final version had to be printed and presented on the date of the exam.

In the module "Forum" during the whole semester each team could ask questions in all areas of concern and obtain detailed answers that could be viewed by all the other teams. Every ten days through messages in the forum the best achievements and the typical errors and deficiencies in the written work were announced and could be discussed without quoting names .

The system was tuned in such a way that for each new message in the forum and for each uploaded file the lecturer received an email to be able to respond as soon as possible.

RESULTS

As a result of placing the International Marketing course in electronic environment during the past semester many problems have been solved. The main benefits of the new technology of work are described in the following section.

1. In the past all the materials, theoretical and applied, were uploaded to an external memory or were sent to the students via e-mail, which took much time and efforts. Now this is not necessary and according to

the students the opportunity to use the presentations, exercises, tests as well as the manual and the template facilitated the organization of their work.

2. Since the system was tuned so that the corrected work could be seen only by the members of a single team, any attempts for imitation or fraud were avoided. At the same time this organization allowed us together with the corrected drafts to upload additional pieces of information that could be used only by the respective team. On the other hand the posted messages for general problems in the forum, according to the students helped them to avoid systematic errors and gave them new ideas.

3. The observations during the semester showed that in this scenario of work the students very well allocated the roles in the teams and for the first time there were no conflicts concerning the obligations. Also for the first time the system allowed us to observe how one team was answering a question asked by another team before the lecturer had been able to respond.

4. Under this organization of work the semester proceeded rhythmically and the project work went much faster.

Of course, some problems arose and before the next course they should be removed. For example, we, as a team of trainers, have no information about the number of downloaded documents and the number of the documents used online, and we can not make conclusions about their usefulness. If this shortcoming is removed, it will be possible to assess why some materials are not appreciated by the students and make changes. We also have no summary information about the duration of stay of each student but only about the number of entries. It would be better to make an adjustment when a student has not logged in for more than 48 hours to receive an automated reminder e-mail that the forum could have new messages.

In the course of work particular problems were caused by the fact that the system was arranged to put the projects uploaded by a team not in the order of their arrival but by their name, forcing the uploader to change the file name if it coincides with the previous version. It would be significantly easier if the system could automatically numerate the files and arrange them by the version number.

We could report as a problem the fact that the module “Chat” was not used at all during the past semester. The team has ideas for conducting group consultations through it, for discussion of various topics, and for addressing general problems.

CONCLUSION

The training in electronic environment creates conditions similar to those in individual training and this is the greatest advantage of the depicted methodology. The individualization in this case benefits the complete development of the capacity of students for independent activity in respect of theoretical material for learning with their own rhythm and organization. This increases the motivation and creates a sense of freedom. At the same time teamwork is encouraged in terms of practical work in conditions maximally close to the actual conditions in the companies. In the team form of training, easily realizable through Moodle, one can apply personalization by allocation and coordination of the collaborative work. In the process of seeking for solutions in problem situations it is possible for the students to generate new knowledge based on the existing knowledge, applied in practical aspects. The good combination of independent work and teamwork in training leads to the development of critical, non-standard, heuristic and scientific thinking and prepares the students to work in real market conditions.

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TRANSITION AND FAMILY VIOLENCE (THE SITUATION IN BOSNIA AND HERZEGOVINA)

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Summary

In this paper, the authors used an interdisciplinary approach to provide a representation of origin and definitions of "transition" and "violence" and analysed their complex content, position and cause-and-effect interrelationship. The transition is understood as a process of privatization and the establishment of a system of political democracy with elements of political pluralism, parliamentary government and a modern market economy where the main participant would be primarily private owners of capital. In many works, "transition" is understood and beyond, as well as changes in social order, changes the ruling ideology and the collective consciousness, the establishment of different forms of social regulation. The violence involves the abuse of force as an act of aggression that violates a person or destroys the property. At the social level, especially dangerous is coordinated violence as cases of war and terrorism. Since the seventies of the 20th century the term structural violence has been used, which indicates the systemic forms of violence such as racism, sexism, nationalism, heterosexism, and underestimating the elderly, etc. Family violence is any act that inflicts physical, psychological, sexual or economic harm or suffering, as well as threats of such acts or omission of such acts and attention that seriously hamper family members to enjoy their rights and freedoms on the principle of equality in public and private life. Transition and post-conflict societies, like the Bosnian, besides the so-called 'old risks' (such as age, illness or poverty caused by unemployment) occur new risks that are associated with discontinuous work careers, with the uncertainty associated with occasional and short-term employment with a new, vulnerable forms of family and demographic processes. Long-term illness among old people, long-term unemployment, insecure work, single-parenthood, poverty among the employed, etc. are considered as the significant new social risks. The phenomenon of "future's shock" or the pace of change in the modern industrial world in technology, engineering, education, social relationships, lifestyle, etc, is so great that it overcomes human limited abilities of assimilation and its adaptive capability. Previous findings indicate that in Bosnia and Herzegovina there is no detailed sociological study that systematically identifies and analyses the transition risk factors concerning family violence. But in a country that has only recently emerged from a war that has ravaged hundreds of thousands of homes, where tens of thousands of refugees, thousands of missing persons, the unemployed ... few of the representatives of the authorities considers the issue of family violence and social violence, a priority which requires an organized response. Research conducted supports the thesis of the existence of family violence in Bosnia and Herzegovina. The research sample consists of 564 families. The research results support the hypothesis of the existence of family violence in Bosnia and Herzegovina and it correlates with transitional changes and that has a trend of expansion and growth. The "dark figure" of the problem indicates its size and risk, and needs an immediate interdisciplinary and multidisciplinary work of preventive and

interventional levels. Based on the results we have proposed specific intervention actions for reduction and resolution of domestic violence as a result of the transition.

Keywords: transition, violence, domestic violence, inter-relationships, intervention, social prevention

1. Introduction

Dealing with violence in post-Dayton Bosnia and Herzegovina is not particularly difficult, primarily because of its frequency. Each dimension of social relations in Bosnia and Herzegovina, along with every social manifestation, has a violent dimension, whether inherent or consequential, so the subject on violence research is constantly there Bosnian post-war, transitional experience is the perfect witness to the social and economic inequalities arising from the transition which is imposed by the socio-political framework, and the pervasive violence in their parent's culture, and politics – that more is said about in theory than done in practice. The aim of this paper is to explain the facts that suggest a causal interconnection and interdependence of transition and domestic violence. This is manifested in terms of deep-seated deformations and incontinent erosion of the family milieu that is taking on more forms of deep crisis. Any disruption in the social context has a definite impact and repercussions on the family. The common belief in the Bosnian society is that the root of domestic violence lies in a traditional and patriarchal model. The social transition and the psychological and physical consequences of the war such as post-traumatic syndrome, disability, incomplete and disorganized families, the impoverishment of the majority of the population, bad economic situation, high unemployment, fallen standards of living, increased offers of illegal employment, the increase in crime, alcoholism, fallen social values – these are just an incentive for violence to manifest itself. Domestic violence continues to be considered and tolerated as a "socially acceptable behaviour," despite the intensive activities aimed at improving the legal and actual protection from violence in public and private life. Prejudices and patriarchal attitudes are often expressed even by the professionals who should deal with this issue, as they teach and raise young people, provide helpe for the victims or punish perpetrators. The available data from the government institutions that have had the first contact with victims of domestic violence (police and prosecutors) are incomplete and contradictory, and suggest different interpretations and approaches to addressing the problem.

Many research studies on domestic violence have been conducted in Bosnia and Herzegovina, but not a single study includes a period of three or more years. The results of this study can perfectly integrate in earlier research in order to make it possible to follow the continuity and diffusion effects of domestic violence. It is precisely the "dark figures" of the problem that indicate its seriousness and danger, and the need for a quick inter-disciplinary actions on preventive and interventional levels.

2. The definition of Terms

In general, there are two terms that are being used for the total change that is taking place in post-socialist[1] or post-authoritarian societies, often as synonyms – even though there is a difference in terms of their meaning, scope and content. These are the concepts related to transition and transformation process. By taking into account these concepts, we are referring to the theories of transformation and transformation processes of research (german: Transformationsforschung) and transitology as scientific fields that are engaged in the research of these changes. Lat. (Transative - pass), transitions. (Klaic, B. 1978). This very term is used to signify the transition from one system to another[2]. The term transition first appeared in Western literature of the '70s in the last century as a label for transition from industrial to post-industrial society. After the fall of the Berlin Wall in 1989, the term has been used in the literature of social sciences throughout the former Eastern bloc. According to one of the best studies by transitologist Dankwart A. Rustow (1970.), the successful transition to democracy is possible only with variables such as economic stability, political culture and political participation. Guillermo O'Donnell and Philippe C. Schmitter (1986.) are considered to be the leading political scientists in the theory of transition. According to these authors the transition to democracy can be identified by observing the weaknesses of the old autocratic regime and in the change of the game rules of the "pillars of society"[3]. It is a global, not regional process and we can feel free to claim that virtually numerous societies in the modern world are in the process of transition[4]. Highly developed societies are between the industrial to the post-industrial society, the postrealsocialist ones are from the authoritarian to the pluralistic civil system, while the third-world countries are moving from the traditional to the industrial society. Bosnian society is in the state of "wildness" in which there is a clear antitransit movement. Poverty, job loss, family crisis, crime on the increase, the dominance of "turbo-folk" culture are just

[1] In terms of Bosnia-Herzegovina, the most pernicious and most devastating cause is the recent war with all the untold consequence of the war that the war and post-war condition implies, along with the ongoing process of transition that society in Bosnia-Herzegovina is in at the present. Exposure to political violence: persecution, imprisonment, threats, coercion, harassment, repression, concentration camps, injury, loss of home, loss of close persons, separation from family, exposure to constant shelling, snipers, constant threat of violent death, terror, homocides - creates the most intense feeling of vulnerability, fear, insecurity and helplessness. It has been recorded that the terrible war devastations and heavy losses are of incalculable proportions to the extent to which the population in Bosnia-Herzegovina was exposed, including every family in this society which was affected by this abnormal, highly-stressful events which led to the incredible disruption of social structure and social functions of the society as a whole.

[2]. Historically speaking, the term 'transition' is used to describe two major events. One refers to the transition from feudalism to capitalism, and the other refers to transition of war economies to peacetime economics after the Second World War. A common feature of both events was the establishment of a market economy. Transition - a comprehensive process of structural change and transition "from socialism to capitalism", represents a return to a market economy and civil democracy. Areas of transition are: stabilization, price liberalization, enterprise reform, privatization, financial sector reform, liberalization of external trade, reform of the social security system, reform of the political system. The transition in Bosnia and Herzegovina is completely different from other countries "blocked or stifled" and deeper basis of this transition, blocked, paused, resistant to change can be explained by heredity, or the process of restoring traditional values and patriarchy.

[4] John Keane claims that civil society represents"... a simple, dynamic ensemble of legally protected non-governmental institutions that are primarily based on non-violence and the principles of self-organization and self reflex..."

some of the outcomes of Bosnian version of the transition. The lack of synchronization transition activities in Bosnia-Herzegovina resulted in black markets, a parallel currency, hyperinflation, spontaneous privatization, etc[5]. Numerous studies have confirmed the association between poverty and unemployment to be a protective factor of family violence.[6] The fact is that the concept of civil society, in the normative sense, has a positive connotation. However, specific civil society organizations have the ambivalent character. Although the majority of non-governmental institutions, which form the backbone of civil society, stand for nonviolence, the author warns of the danger of neglecting the presence of violence, that is uncivility in a civil society. In more extreme circumstances the violence leads to the establishment of uncivilised society and that is a sign of a chronic deficit of civility in a particular civil society (Keane, J, 2003).[7] When violence occurs or there are signs that it could occur, many systems such as influential violence prevention groups (Mitchell and Büchele-Ash, 2000) get involved in the process. This is especially important to keep in mind when analyzing the structure of non-governmental sector in Bosnia and Herzegovina, where we meet ethno-nationalist associations and groups that favored militaristic tradition in a way that contains all the characteristics of cultural violence.[8] Violence is a historically known phenomenon that is, one might say, as old as human civilization. It leaves multiple, lengthy and extremely serious consequences on the overall life of the people. Domestic violence has a long and a brief history. Unfortunately, the authoritative history contributes to "antiplural" black and white approach, which recognizes

[5] According to the Agency for Statistics in Bosnia-Herzegovina (2010.), there are 3,922,205 inhabitants living in Bosnia and Herzegovina. According to data of the Employment Service in Bosnia and Herzegovina from 31st March 2011, a total of 530,055 persons have been registered as unemployed, and the average number of employed persons has amounted to 677.214 with the low employment rate of young people in particular - under the age of 24 years and older than 55-64 years. The official unemployment rate in B&H is 44%. Out of 76% of all the unemployed were unemployed for more than two years. The number of pensioners was 550,000. About 60% of pensioners in B&H live in extreme poverty, and about 215,000 receive less than 150 euros per month. Every fifth citizen in B&H lives on 1.5 euros per day. Households where the head of the household is (in terms of employment status) retired (19.5 %), unemployed or seeking work (23.4 %), housewives (25.5 %), or persons with disabilities (44.4 %) (According to the data of UN Development Programme).

[6] Poverty may, of course, produce a provocation to oppose the established laws and regulations. However, it does not necessarily give people the initiative, courage and real ability to use force and violence. The economic misery may not lead to any kind of direct violence, but it would be wrong to conclude that there is no connection between poverty, on one hand, and violence, on the other (Amartya, S. 2006).If an effective country supports consolidation of democracy, it is necessary to have these five inter-related arenas. First, there must be conditions for the development of free and active civil society. Second, there must be relatively autonomous and valued political society. Third, the rule of law is necessary, in order to guarantee civil liberties and freedom of associations. Fourth, there must be a state of administrative apparatus which the new democratic government can properly use. Fifth, there has to be an institutionalized economic society. (JL Juan and Alfred S. 1996).

[7] See about the violence issue in civil society Keane, John: "Civil Society: old pictures, new visions", Filip Višnjić, Beograd, 2003., pg. 143-145.

[8] Over the past two centuries of existence, Bosnian society was marked by at least six changes of political-sistematic context that were caused by the actions of the external political factors, such as: Ottoman-Turkish, Austro-Hungarian, SCS-Yugoslavian, period of Independent State of Croatia, Socialist Yugoslavia, and a period of conditioned independence under the rule of "International Community", commonly known as "transition period".

only the aggressive opposition from one side on one hand and the withdrawal and conflict avoidance on the other hand. Violence has many manifestations such as poverty, hunger, intolerance, discrimination, chauvinism, fascism, racism, genocide, sociocide.[9] Violence, we can say, represents a sort of compromise or shortens the life of human beings. Different manifestations of this phenomenon include not only physical, structural, psychological or cultural violence, but also bad governance, organized crime and illegal activities[10]. Violence is a violation of fundamental human rights and is the responsibility of both the individual and the society. According to the sociological lexicon (1982): "Violence includes escalating behaviours such as: physical abuse, economic manipulation, social and sexual abuse." Domestic violence[11] can be defined as a set of behaviors designed to control others by force, intimidation and manipulation. This is a specific form of violence because it occurs and takes place within the family, and family is supposed to be the place where the closest and warmest human coexistence take place. Domestic violence is not a normal part of community life, and is socially unacceptable, but still we can not say that there is a society that is free of domestic violence.

Domestic violence in the past was considered to be a private issue. Gillespie notes that this evidence is based on the passivity and helplessness of abused woman, and opens the door to reinforce existing stereotypes about abused women (Nikolic-Ristanovic, V. 1984). In a number of "developed" countries around the world, since the '70s of the 20th century, as a result of the manifest consequences, domestic violence has been recognized as an important social and political problem that can be approached seriously, systematically and scientifically. Domestic violence has been addressed earlier in the 1920-ies and 1930-ies by the Slovenian women's movement (Medarić, Z. 2011.). However, it was not until the early '70-ies, before they began to seriously investigate violence against women and violence in relationships. In the 80-ies the focus of interest for experts is the sexual abuse of children. In the early 90-ies they started to study violence against elderly people in the family. The key moments in recognizing the problem of domestic violence and its successful transition from the the private sphere issue to public issue that is ranking high among the local, national and international priorities, includes the impact of the feminist movement, the discourse of the European Union, the adoption of legislation on prevention of domestic violence, etc. According to the estimates of many organizations dealing with this problem,

[9] Charles Ingrao, Thomas A. Emmert, (2010): Confronting The Yugoslav Controversies (Central European Studies), inicijativa naučnika, Memorija, Sarajevo

[10] Structural violence is a term that was first used by Johan Galtung in the '70s of the last century. The mentioned term denotes a form of violence in which a particular social structure or institution is slowly killing people in a systematic way, by making it impossible for them to exercise their basic needs. Structural violence inevitably produces conflict, and often direct violence, including elitism, ethnocentrism, classism, racism, sexism, nationalism, racial violence, hate crimes, terrorism, war and genocide, and domestic violence, which is certainly evident through the example of Bosnia and Herzegovina.

[11] When analysing definition of the family, this one stands out: "The family consists of parents, or at least one adult, and children, or at least one child living in the same household, they successfully operate as a community that meets the needs of its members, and their relationship is based on consanguinity, legal (marriage, adoption) or simple regulation "(Adžajlić, A. et al 2005). According to the structure, functions and valued orientation, there are several types and forms of families: monogamous, polygamous, matriarchal, patriarchal, complete, incomplete, nuclear, extended, authoritarian, democratic, etc.

at least every fifth woman who is living together with her partner has experienced physical violence at least once, and every second woman knows of a case around them where a woman has been abused in her relationship. According to the United Narions Development Funds for Women (UNIFEM) research, domestic violence occurs in one of three families, and there seems to be no place in the world where domestic violence has not occured (Ajduković, M. et al 2008). The data show that there it is more likely for a women to experience violence by a current or former partner than by any other person (Reid, 2003:15). Epidemiological studies show a relatively high prevalence of violence between partners. It turned out that 8% to 37% of women are exposed to violence in marriage (wrightsman and Deaux, 1981., Frieze, and Brown, 1989). What stands out is widely spread tolerant attitude towards physical abuse of women (Pećnik, 1990). Although a number of studies demonstrated the existence of mutual violence between partners (Straus, 1980; Stewart et al., 1987. And others), there are only some data on the number of women exposed to violence and it is relatively low and vary considerably depending on whether the data source is official by the police or it is a self-report. It has been proved that the woman is the most violent in self-defense. (Saunders, 1988.; Bowker, 1983). Intimate partner violence (IPV) often begins even before marriage, so that on the basis of certain conduct on pre-marital relationship one can predict the occurrence of violence in marriage (Frieze & Brown, 1989.; Pećnik, 1990.; Newspaper, 1993. And others). Intimate partner violence (IPV) is known to occur among all social classes. (Stewart et al. 1987). The term of intimate partner violence (IPV) refers to the systemic form of abusive behavior that occurs over a long time, for the purpose of control, domination and intimidation. Such behavior includes verbal violence and threats, physical, psychological and sexual abuse, breaking things, abuse of pets, etc.

In the historical context, the process that helped create a modern state, attributed the power of the family to a man (Sauer 2002, according to Nikolić-Ristanović and Dokmanovic, p. 2006. 176). An individual act of violence is not random and not an isolated event of control loss. On the contrary, such episodes are part of a complex, ongoing pattern of behavior in which violence is an integral part of a relationship dynamic which is primarily characterized by power and control. Most of the correlation studies of domestic violence focus on the individual variables and seeks to determine their significance in the development of violent behavior. It is all to do with the "univariant" or "primarily-effective" models. However, the causal mechanisms of violent behavior are multifaceted, complex and transactional (eg, multiple risk and protective factors interact with each other during the development). Considering this, today we tend to integrate developing factors in the ecologically valid models (Cicchetti, Lynch, 1993). Regardless of the type of violence, the results of numerous studies show that families in which it takes place are largely disorganized, with poor socio-economic status and are socially isolated. Domestic violence in Bosnia and Herzegovina, due to the recognition of problem distribution, is defined by the social and relevant legislation that has been adopted along with the systematic actions. The non-governmental organizations have played a significant role in domestic violence setting in a family, which is a specific problem in the public sphere. The documents of internationally-legal character are binding the state of Bosnia and Herzegovina, including its entities to take all the available measures to prevent domestic violence, protect victims

to the greatest possible extent and punish appropriately the perpetrators. In 2009, the Council of Ministers proposed and adopted a strategy of prevention and fight against domestic violence in B&H from 2009 to 2011. This strategy defines the objectives, actions and bodies responsible for policies aimed at preventing and reducing domestic violence and binds the community to prioritise this issue, express the political will and provide the resources and multisectoral approach.[12] The difficulties in this study are contained in the facts: the social tolerance of domestic violence; domestic violence is considered to be private and not public; understatement of government regulation on the level of privacy; a number of stereotypes found in relation to the family and family relationships and roles; male domination, tolerance in the preservation of domestic violence within the private sphere; The key factors include the traditions of religion, lack of development of social institutions. The aim of this paper is to investigate the quantitative and qualitative forms of occurrence of domestic violence, identify and analyze the causes of domestic violence, the presence and types of violence, as well as determine the social consequences, and others, arising from the transitional changes. A special part of the work is determining the measures and actions to be taken into account in order to reduce or prevent the violence. The paper used the method of theoretical analysis and survey research methods and instruments of the survey questionnaire designed for families intent of this research.A special part of the work is determining the measures and actions to be taken in order to prevent, reduce or prevent the violence. The paper used the method of theoretical analysis and survey research methods and instruments of the survey questionnaire designed for families intended for this research. The study was conducted on a sample of 564 families[13] randomly. Respondents were persons of both sexes (which at the time of the research was 18 years and over). A total of 28 interviewers were engaged and trained for the study (the implementation of the survey). During the processing of data, the statistical package SPSS 16 was used. The analysis of data consisted of basic statistical analysis (distribution frequency of variables) and a comparative analysis between the variables. For data analysis, we used the correlation coefficients and chi-square test. The level of significance for this study was on $p = 0.05$.

3. Data Analysis, Presentation and Interpretation

1. When asked how many members there were in your household, the answers were as follows: two members (104), or 18.44%, three members (150), or 26.59%, four members (210), or 37.23%; five members (80) or 14.18%, and six or more members (20) or 3.55%.

[12] National Strategy provides the analysis and alignment of legislation in Bosnia and Herzegovina, which regulates the field of domestic violence, achieving greater protection for victims of domestic violence, public awareness of violence issues and the promotion of prevention and systematic collection, integration, processing and publishing data on domestic violence.

[13] When it comes to general information about families and their members, we took some demographic parameters (number of family members, the completeness of the family, gender, age, education level, employment status, disorganization of marriage, number of children, religious commitment, ethnic background, place of residence).

2. According to their place of residence – there were 205 or 36.35% from rural families, 198, or 35.11% from urban families and 161 or 28.55% from suburban families.

3. When asked how they saw their family, the answers were as follows:: patriarchal - 420 respondents or 35.00%; Modern - 155 respondents or 12.92%, a combination of these two types - 625 respondents or 52.08%.

4. When asked whether they had ever been a victim of domestic violence, the answers were as follows: Yes - 36.25% or 459 respondents No - 61.75% or 741 respondents.

5. When it comes to the completeness (wholeness) of the family in this study, there were 448 complete and 166 incomplete families: 95 Single-Parent families was and 21 No Parent Families; 180 families where no one had an employment and 90 families who made the living on their pension. Research shows that violence is more prevalent in families that are complete in 65% of cases (usually violent behaviour by husband towards his wife), whereas in incomplete families the violence is present in 36% of cases (usually violent behaviour by children towards their parents).

6. When asked about the most frequent forms of violence, the results show that most victims suffered physical violence: 115 persons or 9.58%, followed by psychological violence, 78 people or 6.50%, followed by sexual violence in 33 cases or 2.75%, social cases 53 or 4.42%, economic violence over 35 people, a combination of these forms - 155 cases or 12.92%. 731 persons or 60.92% eclared that they were not a victim of violence in their family.

7. According to the age structure of respondents, most victims were women aged between 19 and 27 – 168 of them, followed by the number of 126 women 126, aged between 28 and 45 years, while the number was significantly lower when it comes to women who have suffered violence that were aged over 46 years – 68 of them. When it comes to violence against men, the results show that they are less exposed to violence (almost four times less), and only men aged over 46 years have frequently suffered violence – 44 cases, while the lowest number of victims are men between the ages of 19 and 27 years – 9 cases.

8. When asked, what was the most frequent way of violence, the answers were as follows: The most frequent was pushing – 85 persons, slapping in the face (more than once) –26 persons, slapping in the face (once) – 31 persons, pulling hair – 29 persons, hitting – 26 persons. Some of the respondents said they suffered violunce in the following ways: pushing to the wall – 20 persons, scratching and forcing them to leave their home – 19 persons, twisting their arms – 12 persons, use of cold weapon – 8 persons, tying their hands – 7 persons. The least frequent forms of physical violence were as follows: strangling – 2, 27% or 6 persons, causing burns – 1, 81% or 4 persons, use of fire weapon – 1, 81% or 4 persons.

9. The most frequent forms of sexual violence according to the answers of the respondents were as follows: *forced sexual intercourse – 46, 48% or 33 victims, forced oral intercourse – 12, 68% or 9 victims, other forms of sexual violence such as crushing genital and anal*

parts –11, 27% victims, forced oral intercourse – 9 victims, forced masturbation – 6 victims rape – 4 victims, sexual intercourse after physical violence – 10, 6% of women. A total of 51, 5% of women who have suffered physical violence responded that they have never responded with violence back.

A significant data for the statistics is that the respondents didn't classify incest under the form of sexual violence whereas they did classify prostitution and pornography under the form of sexual violence – in 4, 22% or 3 cases.

The result of x^2 is 108,03, which is far higher than the threshold value and the responses that the respondents gave back are not accidental but statistically significant. All the respondents had the same attitude on sexula violence: they all considered it to be one of the hardest forms of violence that leaves victims with not only psycho-physical consequences but also social consequences as well.

10. When asked if they had suffered mental violence, the answers of the respondents were as follows: underestimation in 45 cases or 11,32 %. Insults and calling them bad names in 44 cases or 11,14 %, followed by belittling in 38 caases or 7,92%. Accusations and use of profanity words in 35 cases. Mocking in the public, limited family visits, accusations of infidelity and harrassment are only some forms of mental violence and seem to be less frequent.

11. When asked, what was the most frequent way of social violence, the answers were as follows: constant control over a woman and whom she is speaking to – 32, 18% or 21 cases, prohibition of spending time with friends and cousins – 28, 12% or 18 cases, prohibition of telephone use at home – 21, 87% or 14 cases,

The result of x^2 is 3,01, which is the 3rd degree of freedom, 0.05 level of significance, the value of chi-square test was 7,81. Since the obtained x^2 is far lower than threshold, we conclude that there is a statistically significant difference between the obtained and expected frequencies.

12. When asked about the presence and forms of economic violence, the answers were as follows: forms of violence such as: controlling the money, forcing the victims to beg for money, present in 20.96% cases of the total violence, forcing the victims to do hard work in over 18.54% or 23 cases, forcing the victims to borrow the money in over 17.74% or 22 cases of the most common forms of economic violence. Subtract (loss) of assets in 5 cases and it is less applied form of economic violence.

13. That the level of education can be the cause of domestic violence is considered by 32.5% of respondents, while 25% considered it not to be the cause of domestic violance, and 47.5% of respondents had not given their answer. Responses received by women, as well as men, do not show a statistically significant difference.

14. When asked about the impact of employment on the level of domestic violence, 48.23% of the respondents said that the unemployment rate increases violent behavior, while 33, 45% said the opposite, and 18.32% haven't answered.[14]

[14] Survey results show that economic violence is the strongest form of violence and occurs mainly between the employed spouse over the unemployed spouse in 53% of cases. In families that are users of pensions as

15. When asked how if they consider poverty to be a protective factor of violence, about 40% of respondents (and nearly half are complete families and only a third areincomplete families) said yes, 20% of them said no, while 40% of respondents had not answered.

16. When asked whether alcohol use can cause violent behavior, 55% of respondents answered yes, and 23.25 answered no, and 22.75% of respondents had no opinion about it. The implied conclusion is that the prevailing opinion is that alcohol causes domestic violence. The responses of both sexes are similar.

17. When asked whether violent content in the media can negatively affect the violent behavior of family, 65 % of respondents answered "yes" 65%, and 23.55% said no. A total of 11.45% of respondents have not answered. Overall, the opinion of the respondents, in general, is that the impact of media on the presence of domestic violence is of high importance.

18. When it comes to ethnicity, the survey was conducted over 440 Bosniak families, 90 Croatian, 25 Serbs and 11 others. This roughly reflects the number of the total population in the area where the study was conducted. On the basis of research results we can conclude a regularity in terms of balanced presence of domestic violence.

19. When asked about the psychological consequences of violence that pushed victims to seek doctor's help, or they are recorded in the medical documentation, the respondents said that the most frequent is depression, then the instability in relationships and low self-esteem, while the suicidal attempt was less frequent.

	Psychological Consequences	Total	%
A	Low self-esteem	19	13,19
B	Anxiety	24	16,66
C	Depression	32	22,22
D	Agression	12	8,33
E	Suicidal attempt	7	4,86
F	Addictions	9	6,25
G	Instability in relationship	29	20,13
H	Poor functioning in the workplace	22	15,27

The result of x2 is 24,53, which is the 7th degree of freedom, 0.05 level of significance value of chi-square test was 14,1. Since the obtained x^2 is greater than threshold, we conclude that there is a statistically significant difference between the obtained and expected frequencies.

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the sole source of domestic income (and economic) is most frequent between the holder of pension towards other family members in 45% of cases. In these families a very strong emotional violence is present between children over the pension beneficiaries, in 35% of cases.

20. When asked about the greatest consequences of violance, related to the functionality of the victims of violence, respondents indicated:

	Types of Consequences	Total	%
A	Physical	76	18,45
B	Psychological	96	23,30
C	Emotional	128	31,07
D	Economic	48	11,65
E	Social	28	6,80
F	Conative	36	8,74

The result of x2 is 26.09, the fifth degree of freedom at the 0.05 level of significance value of chi-square test was 11.1. Since the obtained x2 is greater than threshold, we conclude that there is a statistically significant difference between the obtained and expected frequencies.

21. When asked which are the most common social consequences of violence that the victims are exposed to, the respondents reported difficulties in raising children in 64 cases or 10.06%, smoking, tabletomania in 58 cases or 9.12%, the isolation in 50 cases or 7.86%, while only a few number of respondents indicated social consequences: loss of property - 1.57% or 10 respondents, and sucidal thoughts - 14 respondents or 2.20%.

	Social Consequences	Total	%
A	Stigmatization	24	3,77
B	The problem in establishing social relationships	44	6,92
C	Izolation	50	7,86
D	Loss of job	24	3,77
E	Loss of family or friends	44	6,92
F	Fear of losing custody over children	38	5,97
G	Fear of family accusations	46	7,23
H	Fear of ostricism (ignorance, blockage in communication)	24	3,77
I	Unwanted pregnancies	22	3,46
J	Loss of property	10	1,57
K	Smoking, tabletomania	58	9,12
L	Difficulties in raising children – identifying with parents	64	10,06
M	Alcohol, psychoactive substance	18	2,83
N	Inefficiency at work	44	6,92
O	Suicidal thoughts – suicide	14	2,20
P	Debts	46	7,23
R	Unemployment	36	5,66
S	Financial addiction	30	4,72

The result of obtained x^2 is 56, 58 and in terms of freedom degree and threshold value, we can conclude that there is not a statistically significant difference between the obtained and expected frequencies.

22. We asked respondents what way they are socially isolated:

The most common form of social isolation, according to the statements of respondents, is a problem to do their own maintenance – the problem of residential nature in more than 104 victims, or 15.02%, and isolation from friends and relatives in more than 100 cases or 14.45%, a parent convincing children to be against another parent in 80 cases to 11.66%. These are the reasons for the feelings of alienation in relation to the wider community, the abuser takes advantage of the right to visit and turns it into a threat, difficulties in maintaining and establishing relationships with other people and the problem of concentration.

23. Na pitanje povjerenja u institucije sistema (policija, Centri za socijalni rad, nevladine organizacije) u smislu prijavljivanja nasilnog ponašanja, skoro dvije trećine ispitanika, njih 62,34% su odgovorili da nemaju povjerenja, da imaju povjerenja izjasnilo se njih 22,25%, dok njih 15,41% se nije izjasnilo. Navedeni odgovori ukazuju da se nasilje taji, krije i poriče te da se ne prijavljuje određenim institucijam i organizacijama.
When asked whether they trust the institutions of the system (police, Centres for Social Welfare, NGOs) in terms of reporting violent behavior, almost two thirds of respondents, 62.34% responded that they have no confidence, 22.25% said that they trust them, while 15.41% of the respondents haven't had an answer. These responses indicate that the violence is still kept in secret, hidden and denied, and is not being recorded in certain institutions and organizations.

Conclusion:

Domestic violence is forever a taboo subject, it exists now, it has existed in all times and has always been suppressed as irrelevant. The research results relentlessly show that domestic violence is a widespread problem in Bosnia and Herzegovina, and thus represents a serious violation of fundamental rights and freedoms.
Social transition, the psychological and physical consequences of the war such as post-traumatic syndrome, disability, incomplete and disorganized families, the impoverishment of the majority of the population, poor economic situation, high unemployment, decline in social values – this is just the encouragement to manifest violence.
The most common form of domestic violence is physical violence, followed by psychological, social, economic and sexual violenc. Unfortunately, there are estimates according to which each reported case of violence in the Bosnian family equals to ten more cases of violence that go unreported.

Because domestic violence is a social and not a private problem, there is a need to establish services to provide comprehensive support to people who have experienced violence and rebuild their trust in institutions that provide legal assistance to victims of violence.
It is necessary to organize interdisciplinary teams at the local community so that, in cases of violent behaviour, they can provide services in the implementation of programs for prevention of violence and will work closely with government agencies. Through the development of information system (database) they will collect the data and distribute the information on domestic violence.
It is necessary to define priorities, working methods and provide financial support for research on causes, consequences and prevention of violence. It is necessary to grab public attention on the problem of violence through the media and develop a responsible attitude towards the promotion of gender relations based on mutual respect and equality.
It is necessary to do a comprehensive strategy at the national level (including all levels, from individuals, families, local communities and beyond) inspired by the economic, social, political and demographic change and ethnic tolerance, which may be a condition for successful prevention. To prepare such a strategy, it is necessary to use the experience, programs and models from other countries, especially from the European Union member countries.

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TRENDS IN THE ENGINEERING EDUCATION FOR ICT SECTOR IN THE SLOVAK REPUBLIC

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Key words: *attributes of engineer, competences, skills, curriculum, needs of sector, information-communication technology*

ABSTRACT

The target of the paper is the identifying main trends in engineering education for information and communication technology sector or industry under the aspects of changes of value chain, technology, market, policy etc. All kinds of changes in the economy, society and environment have the impact on the needs and expectations that new engineers must fulfil. The expansion of information and communication industry creates the necessity for new qualified professionals and also creates the new time and spatial dependences between education, social development and economic activities. This contribution explains impacts of these dependences or qualitative changes on curriculum development and it describes the experiences in this field at University of Zilina, Slovak Republic.

INTRODUCTION

The fast technology changes in the information and communication technology (further ICT) require the "intelligent" education with "balanced" using of the long-valid principles, the newest information and developing the skills and competences of the students. The changes of the curriculum, contents and forms of education or learning are characterized by conversion from classic to integrated education and learning. The main elements of educational programmes for the society based on information, knowledge and creativity are:

- Flexibility of subjects and curriculum
- Diversification of the education forms
- Life-long learning and distance learning
- Short or long courses
- Workshops and conferences
- PhD studies etc.

The development of higher education system and institutions in the Slovak Republic during the past two decade are quite extensive by the number of students, the number of programs or the faculties and institutes. It was similar as in another transition economy. But the modern university management is connected with the interdisciplinarity, research, academic culture and creativity. They have to be included to the all processes and activities on the university, e.g. to the innovation of profile or key competences of graduates.

The ICT sector represents all subjects, firms and institutions etc. that produce ICT products including content and media products. They must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display (by OECD product classification). The market of ICT products/services/applications is formed by hardware and software producers, network and service operators, providers, content suppliers and final users. Rate of these participants is changing and depends on product/service/application specifications and on market segments, e.g. private or business customers.

NEEDS OF SECTOR

Contextual curriculum, in profiles and specified alumni scope is needed to be permanently submitted to critical analysis in several valuation views. As the most important is the valuation aspect, related to content filling, from the point of labour market view in a sector. Business sector requirements for the student knowledge, skills, and abilities have been the part of a large number of researches in our country and abroad too. The results of these researches are generalized within the scope of the European university area, but it is needed to emphasize, that opinions coming from the national and sectional assignments are similar. They mention that academic environment and business environment opinions about the most important student knowledge and skills are different. This means, that progress of the characteristics examined from the characteristics with the largest stress, up to those with the lowest stress by the knowledge, skill, ability is under consideration for the purpose of alumni's successful exertion at the labour market, when knowledge, abilities, skills are under consideration. All these should alumni obtain for purpose of alumni's enforcement in a labour market, does not show from the professional sphere point of view sufficient harmony.

The labour market prefer for example student's communication skills and team work, but the university teachers judge for example theoretical knowledge in a professional sphere or the ability to use information-communication technologies the most. Labour market awaits changes in development of not technical skills at the university educational programs.

The new economy, information society or knowledge society impose a shift in the structure of education and training and also in the skills obtained by students during their education. The engineers of tomorrow must be educated for tomorrow, for solving new problems that are another kind like contemporary problems. New curricula, subjects, courses for the new economy, the globalization era cannot include only the theoretical knowledge of engineering disciplines but must implement, include also the social sciences from philosophy and ethics to ecology and environment. The complexity of solving the scientific or technology problems requires some other abilities like in the past. Figure 1 demonstrates the changes in the importance of engineering and managerial abilities and skills.

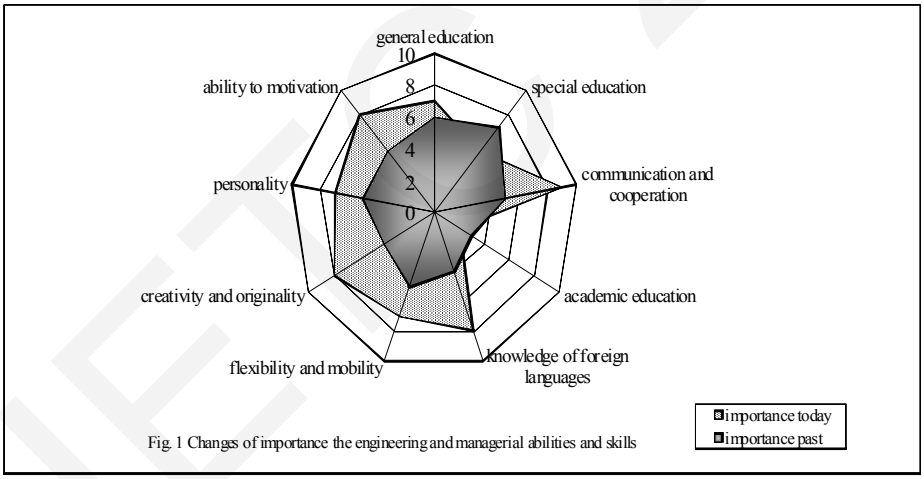

Fig. 1 Changes of importance the engineering and managerial abilities and skills

Just the social competencies are very important in the most professions and their importance is growing with the rank in the enterprise hierarchy. If the professional skills of the employee are sufficient, e.g. hard knowledge and skills, than on the higher rank are put another requirements on him/her related with soft skills and knowledge. The social competencies include: communication skills, crisis management, styles of management, ability to motivate oneself and also another people etc.

Discussions about study profiles of technology university graduates resulted in acceptation of two significant documents of European and worldwide prominence [1],[2]. Present-day professional public has no doubts that technology university students have to be given the knowledge from non-technology domains, e.g. in the courses such as philosophy, economy, sociology, ethics, aesthetics, law etc. This

results from the fact that a representative of engineers has to be flexible, creative and responsible for consequences of his/her doings. In addition the new social-economic conditions, especially those in the transitive countries, ask for a qualitatively new generation of specialists and professionals that will cope with the latest technological trends and will be successful in management of business subjects.

ATRIBUTES OF ENGINEER IN ICT SECTOR

One of the shifts, the university (faculty or department) should achieve by the university education nowadays, is content and methodological supporting the international defined „engineering attributes“, which are transformed to 10 characteristics (by the University of Žilina) These characteristics were applied also for the conditions of engineers in a ICT sector. These characteristics are:

- Usage and convenient application of knowledge from the area of technologies and services to labour market
- Experiments creation and managing from the area of technologies and services, as well as analyzing and data and information interpretation as a result of search.
- Technology, process and service innovation, as the customer demand satisfaction
- Ability to work efficiently in a multidisciplinary team
- Diagnosis (identification and formulation) and problem solving, emergent in a operational and economic business system
- Professional and ethic responsibility
- Effective communication (outside and also inside the company)
- General knowledge widening (general orientation, overview) for understanding the incidence on solution and decision in a postal sector in a global/social context.
- Ability to realize a permanent long life learning
- The best „training“ utilization (do not imagine already made- up and learn on mistakes the others)
- Order, in which are the characteristics shown is not the order of importance, but when whichever characteristic is missing, final effect is debatable and positive image achievement is ambiguous.

Problem	***Traditional access to education***	***Innovative access to education***
Development of skills by doing on the practical projects	low	high
Relations of practise to content of higher education	low	high – more than 50% of study
Requirement of adaptability and re-education of graduates in practice	high	minimal
Flexibility of curriculum in relation with the requirements and needs of practice	low	high
Main topics in study	Facts, information	Logic thinking, creativity, development of skills and knowledge
Form of study	Lectures, seminars, laboratory work, case studies, seminar thesis	Discussion with lectors and specialists from practise, project education, workshops, coaching, working and practice in firms
Content of study	Know-how and experiences of teachers	Needs of ICT sector

Table 1. Comparison of important characteristics in access to engineering education from the point of view of ICT sector in SR

Tendency and attainment of some positive shifts at the university education for the ICT sector has specified objective very clearly. There are many ways how to achieve this objective, for example changing the education form, changing the role and participation main person involved in education etc. The quality of graduates depends also on several factors that we can divide these factors to three groups:

- physiological and psychological development of the people
- family environment
- secondary environment, that student regularly and intensive perceive, especially during the professional preparation, study etc.

The first and second groups are decisive for general quality of the students and also graduates and for their value preferences. They are constant and they create base for expected quality of graduates. So, the main decisions about the quality of students and graduates are related with secondary environment characteristics or processes.

CONCLUSION

Modern approach to university education for the ICT sector represents the progress from the number manager to creative employees, new ideas creators and innovators, because also in the ICT sector, productivity market will have to be replaced by the creative world. The world of perfect working-plan officers and optimizers roll over new profession than creative and innovation engineer, business innovator, thinking innovator, innovation manager. Creativity, innovation ability and change ability will win. The using of ICT in education and its processes can be assessed as one of more innovations that are connected with increasing performance and efficiency of teaching and learning activities. Indeed innovations in engineering education have more aspects that are connected to educational technology, trends in the industry and society, adaptation the curriculum, legal aspects or standards. In the presented paper we discussed some impacts of sector changes on the required competences, knowledge and skills in condition of Slovak education system.

ACKNOWLEDGEMENT

This contribution was undertaken as part of the research project APVV-0230-07 Regional dimensions of knowledge economy and VEGA 1/0149/10 Diffusion processes of new mobile services (m-commerce) and their value chain. It benefited from grants from the Ministry of Education of Slovak Republic and the Slovak Research and Development Agency for which the authors express their gratitude.

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USAGE OF TINKERPLOTS TO ADDRESS AND REMEDIATE 6TH GRADE STUDENTS' MISCONCEPTIONS ABOUT MEASURES OF CENTRAL TENDECY: THE CASE OF MEAN AND MEDIAN

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Abstract: Current need for interpreting data, making inferences from existing data, leads to an increased emphasis on the teaching of statistics in mathematics curricula. In order to teach statistics well, teachers should be equipped with content knowledge as well as technology usage. This study addresses the importance of technological tool usage to introduce introductory statistical concepts; mean and median and diagnose student's misconceptions about these concepts. Three teaching experiment sessions were conducted with three 6th grade American students and this paper reports one of the students' work in the teaching experiments. In each teaching experiment sessions dynamic data exploration software TinkerPlots were used. Study findings support that proper usage of TinkerPlots help teachers to diagnose students' misconceptions and help students to think about statistical ideas and focus on interpretation of the statistical results rather than merely understand the statistical computations. (Chance et.al,2007).
Key words: Mean, Median, TinkerPlots, Misconception

INTRODUCTION

National Council of Teachers of Mathematics (NCTM) in *Principles and Standards for School Mathematics (PSSM)* states that "the existence, versatility, and power of technology make it possible and necessary to reexamine *what* mathematics students should learn as well as *how* they can best learn it" (NCTM, 2000). Being well equipped requires strong preparation. This preparation includes, academic content knowledge as well as pedagogical content knowledge, which imply obstacles that prevent students' learning, and students' misconceptions, and students' prerequisite knowledge and experience that they bring to class. This paper will address the role of technological tool, TinkerPlots (a dynamic data exploration software), in helping teachers to introduce introductory statistical concepts of mean and median to students and to diagnose students' misconceptions around those concepts.

Guidelines for Assessment and Instruction in Statistics Education (GAISE) curriculum framework for PreK-12 states "advances in technology and in modern methods of data analysis of the 1980s, coupled with the data richness of society in the information age, led to the development of curriculum materials geared toward introducing statistical concepts into the school curriculum as early as the elementary grades" (Franklin & Garfield 2006, as cited in Garfield & Ben-Zvi, p.93). Langrall & Mooney (2002) suggests a framework that represents the middle school students" statistical thinking as, describing, organizing, representing and analyzing and interpreting data. This framework is used as a basis for this study to understand how students learn statistical concepts in middle grades. To achieve a better and complete understanding of these measures of centers, NCTM "has recommended that middle school students (ages 12 to 14) have experiences collecting, organizing, representing, and interpreting data" (Langrall & Mooney, 2002, p.1). Teachers have important role in this understanding process. They need to provide meaningful experiences that facilitate students' construction of concept of mean, median and mode. It is important for students to construct their knowledge about the mean, median, mode by directly involving a data collection process. Thus, they have chance to connect the abstract statistical concepts to the real life situations. The other important way to facilitate students learning of central measures concepts is to have an understanding of how students perceive these concepts. At that point, it is important to detect students' conceptions and misconceptions. The major students' misconceptions revealed in the researches (Li & Shen, 1992; Batenero et.al., n.d) are:

1. Students made errors while finding two weighted means

2. Li and Shen (1992) shows that many students forget to deal with frequency of the given data when they are computing the mean
3. Students know how to calculate the mean and assume this calculation satisfies these axioms, identity element and associativity. Students assume that score of 0 do not affect overall scores mean of an examination scores
4. Students define mean as midpoint or most frequent value

All these misconceptions reveal that " knowledge of a computational rule not only does not imply any deep understanding of the underlying concepts, but may actually inhibit the acquisition of a more complete conceptual knowledge" (Batenero et.al. , n.d) This study reports on how a teacher use TinkerPlots to promote a student's (Zan's case) conceptual understanding about mean and median.

METHODOLOGY

In this study three teaching experiments, each lasts 50 minutes, were conducted with three 6th grade students who are studying in United States. Students' work from each teaching experiment is analyzed by using qualitative analysis. In the teaching experiments, real world mathematical tasks and a technology integrated mathematics lesson layout is used. In the teaching experiments, TinkerPlots was used as a technological tool. All three students attended a workshop about how they use this software before the teaching experiments. The task and teaching experiment layouts were designed to elicit students' conception about mean and median.

In the first session of the teaching experiment, students share their initial knowledge about mean and median concepts and collected real world data to analyze them statistically by using TinkerPlots in the second teaching experiment session. These real life application help students to make sense of the topic by firsthand experience. As NCTM learning standards states that, "Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge." (NCTM, 2010) Usually many students have some idea about mean as in the sense of average from their daily life experiences. Although these prior ideas are not actually true but they have a strong influence on students' conception about mean, median. As a result, students' initial ideas sometimes become a learning obstacle for them.

In the second session of the teaching experiment, students formulate their conjectures about the mean and median of their collected data (e.g. height of the boys and girls in their classroom). And they test which factors affect the mean and median of their data set.

In the third session of the teaching experiment, students test their conjectures and revise their conjectures. They state their understanding about mean and median concepts and summarize what they learn from these teaching experiments.

ANALYSIS AND FINDINGS

In this part, I will analyze students' mathematical understanding in three process cycles as, student's initial level of understanding, changes in student's understanding during the teaching experiment and student's level of understanding at the end of whole process.

Analysis Around Mean Concept

Watson and Moritz (2000) states that students may have an understanding of calculation procedure of statistical measures mean, median and mode without having deeply understanding their mathematical properties . In Zan's case, firstly she defined mean of the height data set as "It is the middle point of my data." After that, I asked Zeyn "Can you check your assumption by using TinkerPlots to see it is always middle point of your data?" Then she checked her assumption with two numbers first as 145 and 150 and see that the mean is half of the sum of two data measures.

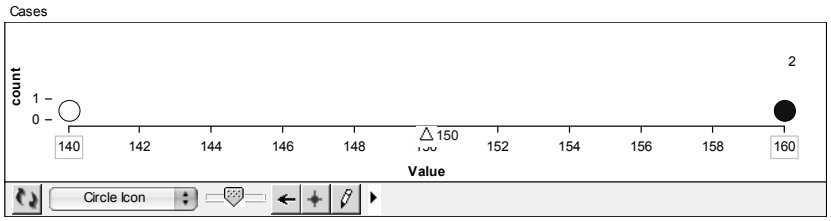

Figure 1: Student's work: Mean of 140cm and 160cm is 150cm

In the previous case, the mean was still the middle value of the given data set. So, I asked "if you have one more height data measure, what happens to your mean?" Then, she added one more data measure and realized that the mean was not the middle measure of her data set. Usage of technology, TinkerPlots, created contradiction with her understanding of mean: the middle point of her data set. TinkerPlots assisted her to attach the meaning of the definition of mean into her experience. She continued to check her assumption by adding or removing data from her existing data in Tinker Plot and write her findings about the mean and median of each data set in her data table. Eventually she defined the mean as, "sum the all data measures and divide the total number of data." As, Ben-Zvi (2000, p. 128) points that, usage of technology leads active construction of knowledge related to mean by "doing" and "seeing" statistics.

The next part of the teaching experiment continued with addressing Zan's interpretation of frequency of the data concept while calculating the weighted means. In order to assess the student's initial perception, I posed a word problem as, "There are 10 students in the classroom 6 of them boys and 4 of them girls. The average heights of girls are 155cm and the average height of boys are 170cm. What is the average height of ten students in this class?" The student said, "since we have two groups, boys and girls we add two means and divide by number of groups: two." After that, I let her to keep continue on the given activity sheet, since in the activity sheet student asked for finding mean of the data measures by adding additional height measures, which were sometimes equal measures, sometimes not. Also, during the process I asked her "If you have two equal height measure data and one different height measure of data, how do you find you mean?" She tried several scenarios in TinkerPlots and observed the mean behavior in each case. Eventually, she reached four conclusions:

1. "If I have some data measures and I add some new measures into my data then my mean will affect."

2. "If I add a data greater than my existing mean, the new mean will increase." Figure 2 shows one of the student's works.

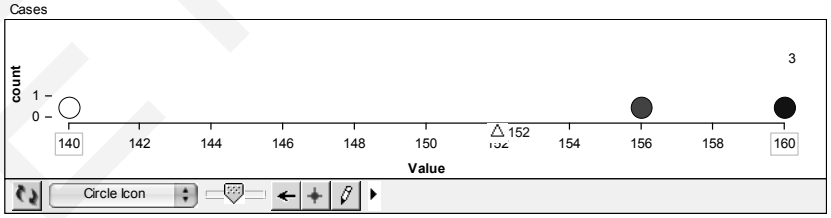

Figure 2: Representation of adding a greater data measure (156cm) than the previous mean (150cm), the new mean is 152cm

3. "If I add a data smaller than my existing mean, the new mean will decrease." Figure 3 shows one of the student's works.

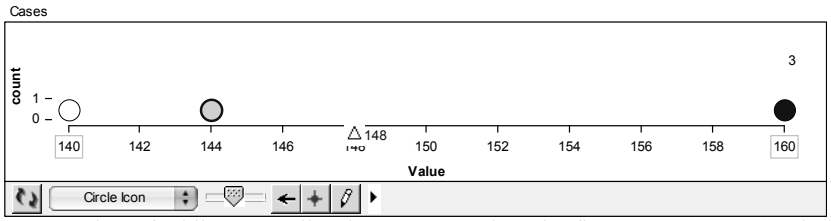

Figure 3: Representation of adding a smaller data measure than the first mean (150cm). The new mean is 148cm

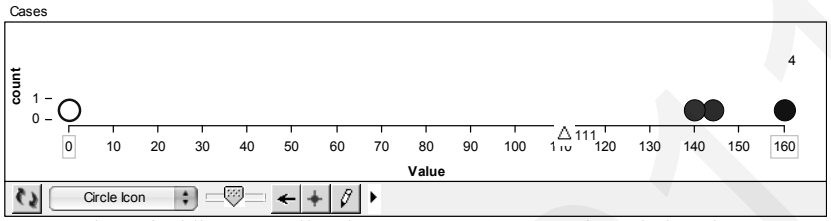

Figure 4: Representation of adding a smaller data measure (zero) to the existing three measures. The new mean is 111cm

In this case, Zan understood that adding zero to her existing data set decrease the mean. Usage of TinkerPlots remediates the previously stated misconception: students know how to calculate the mean and assume this calculation satisfies these axioms, identity element.

4. "If I have equal measures of data, all my data measures contribute to my mean so, I need to divide by number of my data measures not number of groups." (Figure 5A and 5B)

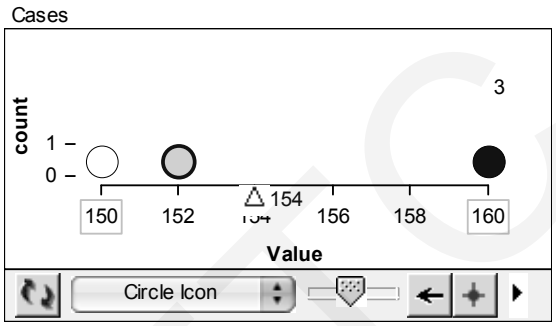

Figure 5A

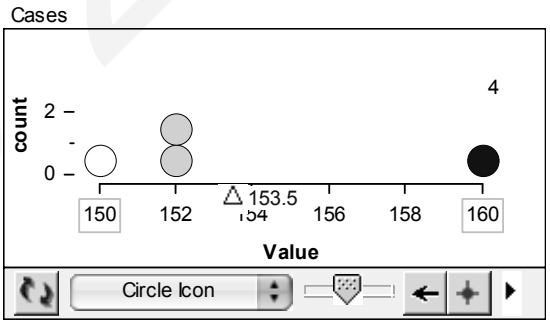

Figure 5B

Figure 5A showed that she added a data measure (152cm) into her existing data set and observed that her mean changed. Figure 5B showed that she added the same data measure and observed that the frequency of the data measure had an effect on her mean. Then she concluded : " in the first problem, I divided group's mean value sum by the number of the groups. Now, I understand that it is not correct. I need to divide my total measure by the number of the total people." First, she multiplied the number of the boys in the class with their avareage height measure of boys to find the total height measures of boys in the class. Second, she multiplied the number of the girls in the class with their avareage height measure of girls to find the total height measures of girls in the class. Last, she added these two total height measures of boys and girls. Then, she divided the total measure by the total number of the students in the class to find the average of height measure of the class. Figure 6 represents Zan's solution process for the first word problem.

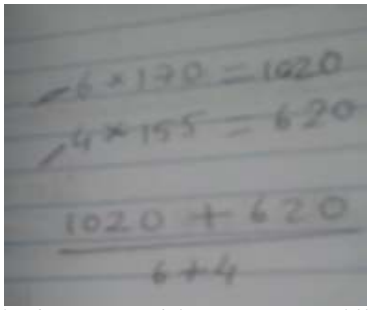

Figure 6: Student deal with the frequency of data measures while calculating weighted mean

The dynamic nature of TinkerPlots allows Zan "to focus on interpretation of results and understanding concepts rather than on computational mechanics" (Chance et.al, 2007). Zan had chance to add, remove and drag cases and reflected observed phenomena and revised her initial thoughts about how to calculate weighted means and how to deal with frequency of data measures while calculating the weighted mean.

Analysis Around Median Concept

Zan's initial conception about median was, it is the middle of the scale. She showed what it means to be the middle of the scale by adding the smallest and biggest value from the data set and divided by two. Then she described the final value: "this is my median." After that, I asked Zan "Can you check your assumption by using TinkerPlots?" With the help of the activity sheet, she tried several scenarios and note down the changes in her median. In her first trial in TinkerPlots, she added two data point to the graph and noted on the worksheet, her conjecture hold. Then she tried three data measures and noted that, her conjecture did not hold. At that point, I asked "why your conjecture did not hold?" She said "in this case it is the mid value of my data set, not the value for adding biggest and lowest number and divided by two." She added one more data measure to the existing three data measures. She said "My median is changed again." I asked "Why do you think it changes again?"

Based on overall observation that she made, she realized that, number of the data measures in the data set affect her median and she revised her conjecture. Her new conjecture was: "My median cannot be half of the sum of biggest and smallest number in my data, it should be something else." Then, I asked "What it means to be something else? What sources may help you to figure out this?" Then she turned back to her notes about each trial that she made. She tried to catch up a pattern. At the end of the teaching experiment, she realized that, when she had an odd number of data measures the median would be the middle data measure of the set. Also, when she had an even number of data measures the median would be half of the sum of two middle data measures.

DISCUSSION

Designing teaching experiments around revealing misconceptions and determining prior knowledge is parallel with NCTM's teaching principle: "Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well." Technology usage has important role for teaching mathematics effectively. In this study, proper usage of TinkerPlots software challenges students to organize data, order data and explore the mean, median and mode by using real life cases. Ben-Zvi (2000) states how technological tools can support students' statistics learning. Table 1 represents these benefits (Ben-Zvi, 2000) and some implications of these three teaching experiments. (2000, p. 128)

Technology Usage Benefits	Example Learning and Teaching Implications from Teaching Experiment
Students' active construction of knowledge, by "doing" and "seeing" statistics	Students can use the collected data to form graphical representations in Tinker plot Students can form different data that has same mean, median and mode
Opportunities for students to reflect on observed phenomena	By adding and removing cases in the Tinker plot and observe their effects on mean, median and mode For instance, they add identity element 0 cm to the cases so they will see identity element also effects mean, median so they can see there is no identity element for mean and median
The development of students' meta-cognitive capabilities, that is, knowledge about their own learning and thought processes, self-regulation, and control	Follow up questions after dealing with technology help students to be aware of their own learning and understanding. For instance, what do you notice when you remove a bigger value case from your data collection? What will happen if you remove the smallest value?

Table 1. Benefits of Technology Usage and Exemplars from Teaching Experiments with TinkerPlots

The important aspect of TinkerPlots is: it lets students' visualization of abstract statistical concepts and immediately reflects the changes in data set on the graph. TinkerPlots gives opportunity to students to apply what if case scenarios by adding or dragging data icons so students can observe and analyze what happens to mean, median and mode of the given data set. By doing so, they can realize which factors affect the mean, median and mode.

All these attributes of the TinkerPlots helps teachers to remediate students' misconceptions about statistical concepts and helps students to explore the meanings of these abstract statistical concepts and understand underlying statistical ideas behind mere computation (Chance et.al, 2007). This study supports the notion that, appropriate usage of technology lets students exercise statistics with real data that allow them to make sense the statistical concepts and their interpretations. (Ben-Zvi , 2000) But, the technology itself is not enough to create these opportunities and experiences. There need to be a teacher assistance to promote questioning, discussion in order to create a complete understanding.

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USE OF NEW MEDIA TOOLS IN EDUCATION: iPAD MODEL

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Abstract: We live in a time of a continual transformation in technological advancements. McLuhan's "*Technological Determinism*" theory corresponds to the daily individual experiences with technological expansion in all areas. New media has an important place in these transformations. New media tools accelerate digital transformation with its characteristics such as digitalization, interactivity, and virtuality. The institution of education, which shapes individuals' future, renews itself constantly according to demands. As we know, young generations are shaped primarily by visual information, thus technologies; especially media-rich technologies become important tools during their education. In this study technology is taken as a helping tool for education. The new media tool –Apple's tablet computer "iPad" is analyzed whether it changes education, how and why? Increasingly, a lot of people including experts say that it shows the new ways to engage students in lessons and make use of cutting edge technology in classrooms. To us, the iPad represents a new pinnacle of the shift from wired society to "wireless society", along with the cellular phones as users become "digital immigrants". The Ipad's intuitive touching experience, its form factor and its thousands of free or cheap applications for education purposes seem very promising and iconoclastic. Applications are especially play a major role because instead of static publications and they are using dynamic content with animation, movies, video, and other multimedia built into it. Some argue that tablets will change education in the future because they align neatly with the goals and purposes of education in a digital age either in or out of the classroom. The impact of Internet and tablets on journalism profession is a good example for high expectations in education field. Even today's K-12 students have the world at their fingertips when it comes to technology, and are only limited by budget when it comes to getting their hands on items like Apple's new iPad. A lot of the success of the iPad (if there will be) as it enters the realm of education will be on the shoulders of iPad application developers, curriculum developers, and educators. In this study, allegedly said six things the iPad will change in schools and education namely textbooks, note taking, paperless classroom, studying and reviewing, student interest level, and individualized curriculum will be analyzed by conducting surveys among application developers, curriculum developers, and educators and students. The questions will provide insight into the parties' perspectives on and interests in the use of new media tools in education. Thus, a model will be formed that will help to show the use of tablet devices in education as a new tool.

Introduction

Today we race with time amid fast information exchange traffic. Under shower of information, people have access to, interpret and share information with others. In this age of information when the information is the most important capital, technological advances have accelerated. Made up with a combination of the words "techner" and "logos" in Greek, technology means "*systematic application of the information processed in the industry*" (Atabek, 2001). Conveyance of the past through papyrus, parchment and paper as technological means of the era to today has made possible the growth of technology rapidly. Particularly the process of conveyance of information by means of manuscripts has become formalized with visual codes, giving birth to a uniform, repeatable and reproducible cultural reality (Innis, 2006). Especially the writing, which is artificial in all respects, is a technology (Ong, 1995). As a result of transfer of the writing to the press systems, technological developments have become more manifest and reached vast masses. Especially as a result of introduction of the Internet to our life, technology has become an indispensible means. McLuhan has brought forward the theory of technological determinism. According to this theory, the community is transformed into a small village as a result of information bombardments (McLuhan, 1992). This transformation is toward the direction where the people will lose their old private identities and will be assigned with new identities within a social structure as a part of the technology. The notion of technological

determinism emphasizes the fact that the destiny of man is not determined by him, but by the technology which is an extension of the man. McLuhan focuses on the fact that the communication means which shape the world direct the affairs of the masses and that the mass uniformity emerges. Technological determinism, especially spread of the Internet, accelerates the sharing of the information. In this sense, the concept of network society becomes important.

Interaction Society

Society of today is referred as the *Network Society*. Underlying the transformation of the people in the information age from the information society into the network society, Castells, starting from the Informational Capitalism, draws the attention to the importance of the information by saying that "*Interaction of the information with the information is the very source of the manufacturing*" (Castells, 1996). Stating that McLuhan announced in his book, *Gutenberg in Galaxy*, that the television is the end of the printing system, Castell announces in the same way the transformation of the information society through the Internet medium into the interactive society. Stressing a society where the technologies working on the information are in the center, Castells cites the determinism of the new order which he defines as the 'informational mode of development'.

The network society conceptualization, in fact, does not bring about a new thing for human kind. Humans live in networked environments as social beings. Being social means belonging to a network. Therefore, new media systems or so called information and communication technologies (ICT) help individuals to be full-time networked. Even when they are out of reach of cables, they help or make it possible to connect wirelessly. So that it is not a coincidence that first Internet and later wireless technologies have been welcomed by the society and widely adapted.

In everyday life we see several examples of pros and cons of being full-time networked in our business life and in our spare time. This connectivity issue is so intense that some scholars argue that we are stepping into the fluidity of interaction in an emerging interaction society from the network society (Wiberg, 2005, p. 15).

According to Wiberg, there is an ongoing broadening of the use of information technology (IT) that traditionally has been applied for calculations, transactions, storage of data, etc., into new areas more closely related to human communication and interaction needs. We mention those areas as social networking, healthcare information systems, e-commerce, mobile phones, tablets and e-learning (Wiberg, 2005, p.vi)

Pervasiveness of New Media and iPad Example

Today, greater part of the society is closely familiar with the institution of school. Especially from the age six or seven on, individuals enter into an interaction with the school and as a result the school becomes a part of their life. The objective of the school is to impart information on various topics, such as living in a society, today's environment, culture, rules or laws to the individual in a systematic way under the name of education. The notion of education, which comes from its Latin roots '*educare*', meaning 'to feed', and '*educere*', meaning 'to grow' (Tanilli, 1998), is defined as "*educating and cultivating of the children by their parents, relatives and older members of the society until they reach the adolescence in relevant with the jobs, functions and modes of behavior they will take upon in the future"* (TDK, 2011). For this reason, education, which plays a great role in maturing and formation of the individual, is the most natural right that the individuals must have.

Duration of education covers more or less one third of one's life span. As a result, we give direction to our future in line with the education we get. Especially university students are equipped with theoretical and practical information throughout the study for bachelor's degree. However, the most important problem here stems from the fact that the student is unable to make the connection of a subject learned in a theoretical course with the real life. In a system based on learning by heart from the elementary and intermediate school to the university, the students are focused on either passing to the upper class or getting the adequate grade marks for the courses.

The mediums designated as 'new' are discerned by examining such characteristics which differ from one thing to another, rather than by passing of time. The new becomes the old depending on the technology which pertains to it.

The communication medium is regarded as the future of the yesterday and the past of the today. While the writing was once the most important technology, it now has become an ordinary medium belonging to the past. What the adjective '*new*' in the new communication medium denotes is very important. The communication itself has not changed, but rather the communication medium itself is designated as new. The medium is a vehicle by means of which the message is transmitted from the source to the target. The new communication medium has the characteristics of being able to bring all known mediums distinct from each other together. As an extension of the digitality, the new communication mediums represent the mediums where the loss of data is prevented.

The communication medium is one of the basic fields where the thought of the human beings is shaped. This field is updated by means of the mass communication means which are shaped through the technological developments. Getting updated makes the use of the word 'new' compulsory. The communication medium is getting transformed by taking on board and getting reconfigured by the advances in the present day, evolving into a new communication process. In short, the new communication media are the fields of communication where interaction at high speeds occurs between various different components in a structure built upon a digital coding system.

Wiberg says that the computers of yesterday were commonly labeled as "information technologies," "IT" or "IS" (i.e., Information Systems). He suggests that it might be a good idea to reinterpret this "IT" acronym because of the fact that more social focus of modern IT use might be more appropriate and talk about IT in terms of "Interaction Technologies" as a general label for what this technology does for us on a social level (Wiberg, 2005, p.4).

Today, as Wiberg mentions, it becomes clear that also the role of the technology has changed from being in the frontline of our attention to now becoming a more pervasive technology that enable us to do new things without directing our attention to the technology per se (Wiberg, 2005, p.4).

In the related literature there are many studies about how to use "computers in education" and "the impact of computers in education". A quick search in Google Scholar reveals 2.6 million results for the former keywords and 951,000 results for the latter to view respectively as early as 1965. When we search these keywords only in ACM Database (Association for Computing Machinery – acm.org) we found 97,413 within The ACM Guide to Computing Literature (Bibliographic citations from major publishers in computing), and found 27,080 within The ACM Guide to Computing Literature (Bibliographic citations from major publishers in computing) respectively. Since its launch in April 3rd, 2010, the iPad (for an extensive review read Angelova, 2011) has got enormous interest all over the world and sold 300,000 iPads sold in the first day (Waters, 2010) and nearly 19 million worldwide in one year (Costello, 2011). This and other products made Apple a big revenue (Apple Reports, 2011) and the brand became the most valuable brand in the world (Prodhan, Sharp, 2011) When you do a quick search "ipad" in Google you get 760 billion results for viewing as of May, 2011. On the other hand, if you search "ipad tablet or apple ipad" in Google Scholar you only get 4,260 results to view. And the search "ipad in education" in Google Scholar you get 10,800 results to view. When we search "ipad in education" only in ACM Database we found only 88 within The ACM Guide to Computing Literature (Bibliographic citations from major publishers in computing) as early as 2010.

Ipad is defined as post-pc product by its creator/producer Steve Jobs and this view seems accepted among both the users and technology producers. As we look at the market share of iPad among other tablets and the number of similar products introduced to the market in less than one year period (Hiner, 2011) we can tell that this may not be exaggeration despite some counter-arguments (Dignam, 2011, Gewirtz, 2011).

This product (iPad) has opened up interesting issues recently. They are interesting because the problems that these issues address are very important. For example, some people show as a concept that iPad (or we think any other tablet too) can be used to allow the blind to use iPad (Moylan, 2011). Another issue is that The US Justice Department is currently testing encryption software – Good for Enterprise – iOS and LRW's Pinecone – to determine if it is suitable for transmitting sensitive data via government-issued iPads. The Federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) may receive up to 4,000 iPads from Apple for use with teleworking, according to The Washington Post. Currently, 80 percent of ATF employees are eligible for teleworking. The US Office of Management and Budget (OMB) gave all government agencies 90 days to explore new technologies and solutions to reduce costs and increase the number of employees

working from home. An astounding 1,000,000 Federal employees are eligible to telework, which is more than half, while currently only 10% do so (Britton, 2011).

We think that the tablet era that we are living through is different than the previous times because we actually see that tablets draw the attention of lay public. We can say thay popularity of technology devices among all levels of society is rising. Their sales are exceeding the PC sales (Dutt, 2011, Harris 2011). And finally, we can say that their "new" method of interaction i.e. touch screen and gesture interface has drawn attention of educators.

Use of New Media Tools in Education: iPad Model

According to Steve Cheney, ever since MIT's famous OpenCourseWare initiative was launched in 2001, people have been fascinated with the power that technology would have on open sourcing of information and the democratization of education. […]The iPad will take customized learning a step further, by factoring in a student's presence. Collaborative and Social tools will enable students to interact with the online and physical world at the same time—sharing info in real-time and making that sharing valuable in the context of their current physical environment (Cheney, 2010).

According to his article in Mactrust, Roberts argue that with children spending on average 900 hours in the classroom and 1500 hours watching TV, the iPad seems to have found stronger support for its interactivity, less harmful advertising, portability, and learning applications. He adds that strong opposers of both mediums were also vocalizing with valid points of getting away from screens altogether and actually going outside and enjoying this great planet we live on. But he argues that the fact remains that perhaps the iPad is a greater tool for your children than TV because of the wide variety of functions and interactivity it can provide and if you just want to watch TV, well you can do that on your iPad anyway (Roberts, 2011).

When iPod was introduced in 2001, there was almost the same flame of enthusiasm as we witness today. Later, iPod device (although it was not a PC alternative or companion at all) has been widely used and the term "podcasting" became familiar in business and educational environments (for example, Bovee, Thill, 2010, p.225-230, Digiovanni, L., Schwartz, S. & Greer, C., 2009)

On the other hand, iPad and similar tablets are very new. It started in 2010. But there are many people thinking and sprending time on how to use iPad/tablets in education platforms. For example, you may look at articles like Penny, 2011 and blogs like Mark Wagner's Educational Technology and Life (http://edtechlife.com/?p=2477), Ian Wilson's iPads in Education (http://www.ipadineducation.co.uk/) Sam Glinksman's iPads in Education blog (http://ipadeducators.ning.com/) and iPad 4 Edu (http://ipad4edu.com/).

According to Wilson, traditionally there have been 4 spaces in education (Wilson, 2010a):

- The handheld space contains products such as the iPod Touch and smart phones, devices which fit into the pockets of learners and are able to be taken anywhere as they can stay with the learner. Due to the small physical form factor and therefore small screen size, it is primary used for 1 to 1 learning.
- The portable space has been filled by laptops, notebooks and netbooks, offering screen sizes of 10" and above with the 17" display laptops offering close on desktop power and functionality.
- Desktop computers provide the power and screen estate to do serious video and audio editing work, both of which are more difficult to do meaningfully on other smaller machines.
- Finally, servers are the workhorses which provide the infrastructure behind institutional networks.

The 'agile' space now created by the introduction of the iPad, although tablet style devices have been around a while, has yet to be proven as educationally useful; indeed some are not convinced that there is any need for another 'space' in learning technology (Wilson, 2010a).

One of the great aspects of the whole iPhone and iPod Touch eco-system, into which the iPad was launched, is the amount of free and cheap apps written for these devices. The iPad can take advantage of this existing situation and can run the vast majority of the current educational apps on the App Store. Fortunately many of the free and cheaper apps have been re-written for the iPad and its larger screen. Given the current financial situation for most schools, the resource of free and affordable software on the App Store is particularly valuable (Wilson, 2010b).

The iPad's most mentioned properties are that the iPad will change in schools and education namely textbooks, note taking, paperless classroom, studying and reviewing, student interest level, and individualized curriculum (http://blog.targethealth.com/?p=15488). They are seemed a bit presumptuous but considering its new way of interaction, and enthusiasm around the product make us search the possibilities of this change.

Figure 1: *Screenshot from iPad showing some apps for writing and educational purposes.*

Some schools already started to adop their iPad pilot programs in their curriculum (I-Pads Continue to Gain Ground at College, 2011, McCrea, 2010, Ferenstein, 2011). Obviously, the iPad has the potential to replace more than just textbooks. Andy Zucker says that the recent introduction of devices like the Amazon Kindle and the Apple iPad is a reminder that the printed book will evolve in the face of new digital devices, new capabilities for users, and new business models. But he thinks that schools must go further than this and asks the following questions: Suppose the textbook of the future included movies, animations, and interactive models so students could better understand complex ideas? What if end-of-chapter quizzes were interactive, allowing students to immediately see their scores as well as links to tutorials for questions they got wrong? How about allowing students to respond to homework assignments directly from the textbook, or permitting teachers to make modifications in the electronic text to meet needs of their students (by changing vocabulary, say, or adding more problems)? Can the textbook accommodate limited readers of English, by speaking text aloud or including an interactive glossary? (Zucker, 2010). According to Donahoo, the iPad is more than simply a media consumption tool. He says "we don't need one iPad for each child; we need each child to have access to an ipad. We need to recognize that creativity is not fostered by technology, but technology is one tool through which creativity can be expressed." (Donahoo, 2011).

Brian Phipps sees the iPad and iOS platform as proactive learning platform that improves education and pays cultural dividends many times over, across every country in the World. He concludes that the iPad's ability to combine textbooks, lectures, class materials, course notes, class work and reference materials in an interactive, networked device could make the iPad a handheld university, a portable and immensely powerful learning platform. Combined with an expansion of Apple's iTunes University, iTunes distribution network, and working arrangements with textbook publishers and universities, the iPad could enable Apple to become a leading brand of education Phipps, 2010). Despite the pros of this platform the biggest problem seems to some is that if there's a specific application you need for a class, if there isn't a similar app already in the App Store, you're out of luck (Crump, 2010). But, educational iPad applications (as of 15th of May 2011 there are 9,581 apps in the App Store) can cost $2, $15, or more, but some programs are available for free, as reported by Carter (Carter, 2010).

Methodology

In this study the data has been collected through survey method. 450 respondents have been asked 19 survey questions via the survey portal of Marmara University (http://anket.marmara.edu.tr/v2/survey.php?sid=284). The survey questions are closed ended questions. Four of these questions measure demographic qualities, two of them about usage of the apple products and the other thirteen comprise the questions concerning the usage of iPad tablet in education.

Findings

Data from 450 respondents has been collected through the survey held via internet. Survey questions have been addressed to 238 males (53%) and 212 female (47%) (Table 1)

	Frequency	Percentage
Female	212	%47
Male	238	%53
Total	**450**	**100**

***Table 1**: Distribution according to gender*

The participants have been asked distribution questions comprising 5 scales according to their ages. Distribution is measured according to the groups between 13-18, 19-24, 25-30, 31-36 and 37 and above. It is found that 19-24 age group has the highest number of members (307 out of 450 respondents) with a rate of 68%. And 54% of respondents have 500 TL or more monthly expenses.

	Frequency	Percentage
Haliç University	53	12
İstanbul Kültür University	296	66
Marmara University	18	3
Other	83	19
Total	**450**	**100**

***Table 2:** Distribution of students universities*

73% (328 people) of the respondents stated that they use Mac products. And 135 of the respondents (30%) were actual iPad users.

Other questions aim to learn respondents' approach to the use of iPad in education. The five point Likert scale is used in the following definitions. Table 3 shows the distribution of assessment the usage of iPad in education.

	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%	f	%
Visual representations are important to achieve clarity while teaching a course.	3	1	-	-	4	1	103	23	340	75
Use of tools is required to support teaching.	25	6	37	8	51	11	113	25	224	50
iPad is an easy to use tool (user-friendly).	29	6	99	23	127	28	116	26	79	17
No special training is required to understand ipad interfaces.	26	7	74	16	78	17	172	38	100	22
iPad is necessary while teaching a course.	15	3	117	26	106	24	160	35	53	12
iPad may facilitate the understanding of courses with several applications.	25	5	42	9	72	16	125	28	186	42
Information provided during the courses may easily and entirely be stored by ipad.	12	3	54	12	110	25	185	40	89	20
I think the touch screen of iPad and similar tablets is a facilitating feature.	3	1	85	19	71	16	61	13	230	51
The fact that iPad and similar tablets reduce the need for tools such as keyboard and mouse increases interaction with the tablets.	5	2	31	7	75	16	221	49	118	26
I think the interface of iPad is more transparent.	3	1	12	3	107	24	284	62	44	10
I think those who are used to using computers may have difficulties with the use of iPad.	126	28	125	28	156	34	35	8	8	2
I think all future computers will resemble tablet computers in size and feature.	4	1	155	34	13	3	173	38	105	24
I think the use of iPads in education will not affect the use of laptop and desktop computers in education.	64	14	196	43	125	28	35	8	30	7

Table 3: *Distribution of assessment the usage of iPad in education*

In order to test the reliability of the scales, Cronbach alpha (α) coefficient has been calculated. The low value of the Cronbach (α) coefficient (close to 0), which is the most common reliability method, shows that the variants are not reliable. The alpha coefficient is found 0.594 if 10 questions addressed to the users according to the five point Likert scale is studied mainly according to the Cronbach alpha values. The alpha coefficient close to 1 shows that the scale is highly reliable.
After conducting a factor analysis using varimax rotation method, we obtained KMO Measure of Sampling Adequacy 0,584 and Bartlett's Test of Sphericity p-value=0,000 which means our sample is adequate for factor analysis. Analysis revealed us four factors. We named these factors as following:

1. "Ease of Comprehensibility" of iPad in courses.
2. "Form Factor" effect of iPad compared to other PCs.
3. "Superiority of Interactive Interface" of tablets copared to PCs.
4. "Ease of Use" of iPad.

When we conduct Mann-Whitney U nonparametric hypothesis testing on these factors among females and males. We saw that in case of "Ease of Comprehensibility" of iPad in courses female and male respondents have significantly different opinions (p=0.001). Female respondents are more tending towards a positive view than male respondents. On other factors they are indifferent.

It was interesting to see the results of Kruskal-Wallis H nonparametric hypothesis testing among different age groups on these factors. We saw that in case of "Ease of Use" of iPad, respondents in 5 age categories have significantly different opinions (p=0.000). Respondents in 13-18 age group are more tending towards a negative view than all other ages groups respondents. On other factors they are indifferent. The possible cause of this result may be the fact that the relatively problematic PC savviness of respondents in older age groups make them think that using iPad or similar tablets is easier than using PCs.

We foud no significant difference among the different spending categories of respondents in terms of all four factors. This may indicate that the amount of spending does not play a role on these factors.

It was very surprising to see the results of Mann-Whitney U nonparametric hypothesis testing among users and non-users of iPads on these factors. We saw that in case of "Ease of Use" of iPad, respondents in two

groups have significantly different opinions (p=0.005). Respondents in iPad users group are more tending towards a negative view than non-users group. On other factors they are indifferent. The possible cause of this result may stem from a possible slow or difficult adaptation period to iPad's relatively new finger-touch interface.

A parallel result is faced when we conduct Mann-Whitney U nonparametric hypothesis testing on these factors among Mac users and non-Mac users (PC users). We saw that in case of "Ease of Use" of iPad, Mac users and non-Mac users have significantly different opinions (p=0.004). Again, this may be due to the "different" interface of iOS compared to Mac OS. Mac users are more tending towards a negative view than non-Mac users. On the other hand, in case of the "Superiority of Interactive Interface" of tablets copared to PCs, Mac users have a more positive view than non-Mac users (p=0.036). This recalls us that Mac-users see iOs as having a superior interface than Mac OS. On other two factors users are indifferent.

Conclusions

Technology is in the foreground throughout the study. Especially the communication media updated on daily basis brings along with it difficulties and facilities. The difficulties may in general be interpreted as the adaptation or adaptation problem of individuals to the media. However, the tablet media offers many possibilities to the individuals. iPad as a new media is becoming a significant rival both against PC and Laptop. With easy-to-use nature and system, iPad offers many features to the users including portability, muldimedia possibilities, interface facility, applications, touch screen usability, convergence and productivity. iPad transforms many elements in education such as book carriage, note taking, follow-up of courses into easily applicable activities. iPad will change the concept of education significantly with many features like Ebooks, voice record of the classes, paperless classroom, electronic note taking, web research, presentation, publishing, art-work, digital storytelling, creativity, studying reviews and individualized curriculum. iPad could provide the students the change to take better care of their educational resources. Especially in today's communication media where the web concept is replaced with applications, the data transfer speed of communication shall speep up with features like productivity, convergence, mobility and community and therefore the communication will increase. Within this context the education will be fast, interactive and productive with the use of new media and the data exchange of students will be more efficient through a creative communication media.

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The Use of the Internet for Educational Purposes

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Abstract The growth of the Internet in the world provides many opportunities to many people around the world in many different ways. When students are considered, the use of the Internet is mainly for social and entertainment purposes. However, it is very obvious that the Internet provides not only social connection and entertainment, but also academic and scientific information as well. Additionally, the Internet can be used as a tool to learn the latest news all around the world as well as getting any kind of information that serves different purposes such as learning more information about a hobby or health. Therefore, it can be said that the Internet is the source of spreading information quickly to a large audience and of going beyond the limitation of time and space. In the light of the above information, it is vitally important to encourage students to use this invaluable source to get any kind of information they need in their academic studies. For the reasons mentioned above, the aim of this study is look at the students' use of Internet in their academic studies. The participants are around 150 English Preparatory School students in Eastern Mediterranean University. These students have come from different countries in order to study at various departments in the university. The study is carried out in the Spring Semester of the Academic Year 2010-2011.

Keywords: *Internet, Education, Prep School, Academic Use of Internet*

INTRODUCTION

In modern life, the communication amongst people varies as there are more than one alternative for effective communication. This has been applied in education as well. In the past, the only way for an instructor to communicate with his students was face-to-face conversation whereas today the messages are able to be conveyed in a voicemail or telephone conversation, a written memo or letter, or an e-mail besides face-to-face interaction.

The variety of the use of electronic feedback on the Internet is one of the rapidly growing areas in every aspect of education, especially in higher education. Using electronic feedback speeds up the delivery and also the quality of it. The most common electronic way of giving students feedback is to use e-mail. There are a number of advantages of using e-mail while giving students feedback. One of them is that an e-mail can be sent at any time and at any place convenient for the sender. Another plus is that the sender has the chance to edit his feedback before sending, which is not possible while giving face-to-face feedback. Also, it is an asynchronous process so when the feedback is sent, the receiver can read it any time he is available and ready. Additionally, time constraints make it impossible to spend too much time with one student in terms of detailed feedback. However, the length of an e-mail could vary according to the needs of the students. The other benefit of using e-mail to give feedback is that students can get as many feedbacks as they would like to or they need to. Thus, this chance is provided for both instructors and students for a better communication while giving feedback.

Consciously or not, especially sending e-mails is an increasingly preferred way for communication between instructors and students in this technologically developing world. In the context of feedback communication, students directly or indirectly ask for feedback via e-mail as this can be considered as a less formal and adequate, maybe practical, way to convey their important -personal- messages (King & Xia, 1997). As Brown (1997) and Gibbs (1992) have discussed, returning feedback to students on their work plays an important role in the learning process. No matter this also requires some technical knowledge or capabilities, online communication for giving feedback is the way that is perceived as appropriate even by scholars (Markus, 1994; Nadler & Shestowshy, 2004).

Some research suggests that negative feedback can cause some problems (Lawler et. al., 1984) so that the recipients tend to shield themselves psychologically from this kind of feedback. Consequently, as research has shown, the recipients who get negative feedback tend to disregard it and believe that it is not useful (Facteau et. al., 1998; Brett & Atwater, 2001). Besides the fact that feedback (either negative or positive) needs to be delivered successfully, it also has to be accepted by the recipient as well (Ilgen et.

al., 1979; Bannister, 1986) as the effectiveness of feedback is determined more by the recipient's understanding than by the rating instrument itself (Feldman, 1981).

BACKGROUND OF THE PROBLEM

In one of the compulsory courses offered by Educational Sciences Department to all Education Faculty students, Research Methods, students are expected to work cooperatively with their instructor. They are supposed to learn the steps of how to research and report the research and follow these steps by submitting a mini thesis at the end of the semester. Because of the nature of the course, it is necessary for instructors to be aware of every step students follow in order to help them better. Students are asked to contact with their instructors and show their necessary documents to their instructor in every step of the study. First of all, they need to show their instructor their hypothesis, the articles they have found to be included in the literature review section, and an instrument to be used in their study and get the approval of him. As the instructor had three different groups last semester and there were around 30 students in each group, it was very difficult for the instructor to arrange a meeting time with each student. In order to overcome the time constraint and to be more helpful to the students, it was necessary to find another way to be more effective in this process. In order to overcome the communication problem and use time more effectively, it was decided by the researcher to use e-mail as a feedback tool.

THE AIM OF THE STUDY

As using e-mail is considered to be one of the effective feedback tools, in this study it was aimed to examine the efficacy of using e-mail as a feedback tool.

METHODOLOGY

Research Design

Action research, which is a process in which participants examine their own educational practice systematically and carefully, using the techniques of research, was conducted during the study in order to find a solution to the problem of immediate communication with the students.

Participants

In the study there were 90 students from three different groups who were studying in different departments of Education Faculty during the fall semester of 2010 – 2011. These students were taking the course "Research Methods" as part of their academic studies.

Procedure of the Study

One of the requirements of the course that students took was to design a research, conduct it and report it. The final report of their own research was one of the components of their assessment. So in order to be successful for this course they had to complete this report successfully. When they were assigned the task, students were told that they could also send an e-mail in order to contact with their instructor, instead of getting an appointment and visiting him in his office or waiting for his office hour every week. They were told that they could contact with their instructor via e-mail in each step of their study in order to get an approval from their instructor. During the study, the instructor mostly communicated with the students via e-mail as this was students' preference and the instructor tried to be online not only during the day but also after school. When students submitted in their reports to their instructors, they were asked to write down their opinions about using e-mail, and they were told that they were free to write any kind of opinions.

RESULTS

Positive Opinions

Table 1 shows the participants' positive opinions about using e-mail as a feedback tool and the students' opinions were put in order according to frequency level.

Table 1 showed that using e-mail saves time was the most common opinion of the students and out of 90, 28 students believed that e-mails helped them save time because they did not have to go and find the instructor in order to get feedback. They reported that sometimes it was very difficult for them to visit the instructor and they preferred to delay it. Even one of the participants said that "I could contact with my instructor without wasting any time, whenever I want."

For the participants another important point was "getting feedback in a short time". 25 students out of 90 believed that this was the most important point of using e-mail as a feedback tool. They were happy that they did not need to wait for another meeting to get feedback.

24 students reported that e-mails made the communication easier. They believed that they faced with problems while contacting with their other instructors due to different reasons such as having meeting, having classes or meeting too many students. However, they commented "e-mails enabled easier communication between me and my instructor."

Students believed that using e-mails gave them a chance to contact with their instructor outside the working hours. They stated "I had the chance to send an e-mail when I was studying at home, and normally I study after school so it is good for me to have a chance to share my opinions with my instructor whenever I want," 12 of the students shared this view and they were happy with it.

Students reported that when e-mail was used as a feedback tool, they had a chance to clarify the topics which were not clear for them. "Sometimes I had some questions in my mind that needs to be clarified and I couldn't have moved on if I hadn't had the chance to ask my instructor whenever I need." 11 of the students reported how important that chance was for them. Similarly, seven of them believed that using e-mails gave them the chance to ask immediate questions to their instructors.

It was interesting to find out that 5 of them believed using e-mails helped them prepare comprehensive reports for their course and five of them reported them using e-mails helped them to study in coordination with their instructor.

Table 1 Positive Opinions about the Use of E-mail

Positive opinions	Number of Students
Getting feedback in a short time	28
Time saver	25
Easier communication	24
Outside working hour	12
Clarifying topics	11
Asking immediate questions	7
Comprehensive essays	5
Work in coordination with instructor.	3

Negative Opinions

Table 2 shows the negative opinions of the students when they used e-mails to get feedback from their instructors.

The most important problem for the students was technical problems when they tried to communicate via e-mail. 18 out of 90 students reported that due to technical problems they didn't believe that e-mails served its real aim and they suffered while using e-mails.

Moreover 14 students stated that using e-mails caused communication problems between themselves and their instructor. "Via e-mail, I believe I couldn't express myself clearly so my instructors' suggestions did not lead me effectively," was a statement from one of the participants. Also, 12 students expressed that their mails were not replied as quickly as they expected and they believed it caused a problem for them.

9 students believed that written information could not be as clear as the spoken one and sometimes due to written feedback, they misunderstood their instructor. They believed spoken feedback could be more effective than the written one and they preferred to have spoken feedback from their instructor. For instance, one participant stated that "Sometimes, I couldn't understand what my teacher had written, I believe written feedback is not as clear as spoken one."

Table 2 Negative Opinions about the Use of E-mail

Positive opinions	Number of Students
Technical problems	18
Cause communication problems	14
Can be replied more quickly	12
Information cannot be given clearly	9

CONCLUSION

Feedback is very important for our students. They want to get feedback in order to move on their studies. Sometimes we, as teachers, may have problems giving immediate feedback and we need to find different ways to help and to guide our students. Sometimes traditional ways are not enough for us to reach our students. In today's world it's necessary to use different technological devices to make our lives easier.

The results showed that students had positive opinions towards using e-mails as a feedback tool because while studying they wanted to have chance to contact with their instructors as quickly as possible and e-mails gave them the chance to do it. Therefore, they preferred to use e-mails.

On the other hand, when technological devices used it should kept in mind the technical problems that both students and teachers can face with. In this study technical problems were the main problem that students faced in this study.

For further study, similar study can be conducted with different students in order to find out whether similar findings will be obtained.

Moreover, in order to find out the effectiveness of using e-mail a comparative study can be conducted. While teacher uses traditional feedback giving methods with one group, he or she can use e-mail as feedback method and find which one is more effective.

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USING SONGS AS AUDIO MATERIALS IN TEACHING TURKISH AS A FOREIGN LANGUAGE

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ABSTRACT

The use of songs as audio materials in teaching Turkish as foreign language is an important part of language culture and has an important place in culture. Thus, the transfer of cultural aspects accelerates language learning process. In the light of this view, it becomes necessary to transfer cultural aspects into classroom environment in teaching Turkish as a foreign language. Songs are one of the instruments which provide students with the information related to target culture. In foreign language teaching, activities which are created by using songs contribute to the development of a lot of language skills from grammar to pronunciation. Therefore, these activities can be carried out in all classes ranging from very basic levels to advanced ones. Additionally, as widely known, music and melody have a positive impact in terms of reducing stress and anxiety. Considering the current literature, the use of activities involving songs in foreign language teaching has positive effects on students within their language learning process and further help them to be encouraged toward foreign language and culture. in this study, the place and the importance of songs as one of the tools to transfer culture and used in Turkish as a forieng language courses will be questioned, and sample activities will also be presented.

Key Words: Teaching Turkish as a foreign language, audio materials in language teaching, culture transfer, the use of songs in language teaching classes

1. Introduction

With the progress of technology, the development of educational tools for foreign language teaching has started to contribute significantly to student progress while learning a foreign language. Therefore, the efforts to adapt these tools, which are developed by the technology of our day, to class environment has become of greater importance. At the same time, the increase in the number of approaches to develop students' skill of communication and cross-cultural interaction is an indicator of the fact that songs are audial and written tools essential for foreign language teaching.

Utilization of visual and audial tools is effective in concretizing the learning process. Using these tools in class environment not only enables students acquire the desired information more quickly, but also makes the information acquired more permanent. According to Tarcan (2004), as multimedia consisting of tools appealing to human senses such as visual and audial tools used in foreign language teaching increase the amount of emotional input, the level and the quality of lingual skills of a person also increases. Accordingly, the quality and the quantity of the output such as writing and speaking skills, which are of utmost importance for language learning, becomes higher. From this point of view, songs, which are audial tools, are important resources for students while developing lingual skills.

2. The Influence of Songs in Foreign Language Classes

Using songs as tools for teaching a foreign language has many benefits. According to Lo and Li (1998), songs are able to change the monotonous mood in the class and with the smoothing effect of music, they provide a comfortable class environment so that students can develop their lingual skills more easily. Besides, utilizing songs in class environment amuses students, helps them feel relaxed and get rid of their negative attitudes towards a foreign language while learning a lingual structure through a song (Sarıçoban: 2000). In this direction, the amusing and relaxing mood brought by songs to the class eases the effects of certain emotional cases such as excitement, anxiety, lack of self-confidence and the feeling of being threatened, in addition to influencing learning process positively or facilitating it by stimulating the student emotionally (Kramsch 11).

In a survey conducted by Joly (1995), the question whether the in-class utilization of songs which were chosen in accordance with the goals of the lesson was helpful or not was directed to students attending a Japanese speaking course. The results of the survey show that the majority of the students favored using songs in the class. In the light of this view of students, it can be said that songs amuse students; they reduce the level of boredom existing in ordinary language teaching and increase student enthusiasm towards studying.

According to Cheung (2001: 57), as students more easily learn the things about which they have background knowledge, student motivation is increased when the elements belonging to the popular culture of the target language are involved in the class. Bringing a song listened by the student to the class environment increases students' desire to learn and enables them contribute to the process of learning by making use of their own musical knowledge.

Songs offer many codes that strengthen student memory such as choruses, rhymes and melodies (Maley: 93). Therefore, these codes in songs increase the functionality of songs in language teaching. When a student listens to and memorizes a song involved in the class, the lyrics are embedded in his/her long-term memory. Moreover, neurological researches have shown that musical and lingual processes occur in the same section of brain and that there are significant similarities between musical and lingual syntax (Maess, Koelsch: 2001).

Additionally, being authentic texts themselves, songs provide students with the opportunity of meeting authentic texts belonging to the target language. According to Schoepp (2001), as they feature examples of daily language, songs help students get prepared for the language they will encounter in daily life. Besides, as a part of daily life, they are the tools of informing the students about the culture of the target language. A song is a literary text and literary texts harbor cultural elements belonging to the language in which they are written.

When the relationship between literary texts and life itself is examined, it is seen that the reality of life and human conditions in literary texts are narrated by being processed in the inner world of the author. In this regard, literary texts have a significant role in comprehending human beings and society with their different aspects. In literary texts written in a foreign language, it is possible to find the reflection of the world of that language, a life which is stranger to us (Polat, 1993: 184).

In parallel with these views, songs, as a type of literary texts, reflect culture and transmit cultural values between people, societies and generations. Therefore, while learning a foreign language, a person can learn about a society and its culture through songs.

3. The Criteria for Selecting Songs in Language Teaching

As also mentioned above, songs are essential sources to be utilized during language teaching. Besides positive effects, there are of course difficulties encountered while using songs in language teaching. Terhune (1997: 8) lines these difficulties as follows:

1. Pop songs are not scientific. Therefore, some teachers and students do not think that they are effective tools in education.

2. As each student has a different way of learning, some students may have difficulty in studying through music.

3. Inefficient sound systems in schools may cause problems while listening to songs.

4. The types of music favored by students may not be matching with each other.

5. Songs which are not grammatical or those involving complicated sentence structures may confuse students.

6. In some songs, there may be embarrassing parts which cannot be explained to students.

7. Repetition of a limited number of words may cause the song to seem boring or ineffective.

According to Jensen (2000: 2), many teachers do not have sufficient knowledge about music and teacher training programs do not involve anything regarding how to utilize music in language teaching.

Another disadvantage of using songs is the lack of the ability to slow down the tempo of the song when a grammatically difficult part is playing, or to fasten it when there is the repetition of certain parts (Miller, 1999). Moreover, some teachers may think that they cannot sing, but using songs in the classroom for this aim does not necessitate any expertise in this field. Teachers can accompany the song while it is playing or in cases where students do not prefer to sing a song alone.

Despite these disadvantages that songs have, the number of such problems can be reduced if teachers have sufficient knowledge about using songs in the class. According to Terhune (1997), if they are used in classroom wisely and in a balanced way, songs can be perfect sources for teachers. For instance, students may think that songs do not have any educational significance as utilizing them leads students off the syllabus and the course book. For this reason, the teacher should involve certain activities which show that using songs in the lesson has a significant motive. Therefore, in order to avoid the misuse of songs, there are certain criteria to be considered for choosing the song to be utilized in the class.

While utilizing a song in classroom environment, the language of that song, age and language level of the students, areas in which students and the teacher are interested in should be taken into account. In order to utilize songs in the best way, a certain amount of attention is required. Sarıçoban (2000) recommends using songs which harbor frequent repetitions or a story or interpretations on life or cultural elements. Griffe (1992: 8) lists four elements to be considered while choosing a song to be used in the class as follows:

1. Classroom environment (number, age and interests of students; lesson hours)

2. Teacher (teacher's age, interest in music and aim to use the song in the class)

3. Classroom facilities (flexibility in lesson plan, classroom equipment)

4. Music (lesson plan and equipment such as the volume, sources of music, copying machine, board, etc.)

The content of the song chosen to be used in the classroom is also important. Some songs may contain embarrassing elements for students. Sarıçoban (2000) divides songs into two categories as those suitable for adults on advanced level of language and those appropriate for children. Meaningful and popular songs which also harbor cultural elements as well as grammatical patterns should be chosen for adult students on intermediate or advanced level, whereas more familiar or internationally-known songs should be selected for children. Griffe (1990) recommends using short and slow songs for students on beginner level. Crosswords, drawing or picture showing exercises can be conducted with such songs. For the students with a higher language level, long and fast songs which tell a story should be used. The song to be chosen should have a clear sound and it should be comprehensible; there should not be too many instruments played with a high volume in the song.

A song chosen should always contain a grammatical structure or a lingual subject. The diction of the singer should be clear so that the student will understand the lyrics more easily. The song should be chosen form a music genre favored by a major group of listeners. For example, if the teacher makes the students listen to only classical Turkish songs, then the students may feel bored with the lesson.

Applying these four criteria above during a lesson ensures that songs are optimally utilized in the class.

4. Activities that can be applied in Turkish as a foreign language classes through the utilization of songs

Activities that can be carried out with songs in foreign language classes can be classified in three groups as pre-listening, listening and post-listening activities. Here, a teacher should carefully think about what a student will do before, while and after listening. Below are some recommendations regarding these activity stages and what kind of activities a teacher can use in these stages.

4.1. Pre-listening activities

In this stage, the teacher ensures that students are ready for the listening activity to be carried out. According to Davenellos (1999: 14), the aim of this stage is to prepare students to a topic grammatically, educationally and psychologically. Before playing a song to students, it is necessary to introduce the topic, the keywords and the grammatical structure. In this stage, in order to activate students' background information, it may be suitable to ask the students to guess the theme of a song, to brainstorm about it, to present or to discuss the cultural information that the song includes or to state the keywords and the ideas in the song.

Pre-listening activities enable students to be aware of the purpose of listening to the song and to focus on the meaning of the song while listening. Besides, it is also possible to use songs by deliberately removing a part of their lyrics and to conduct activities in which students predict or derive the meaning of a word out of the context (Vandergrift, 1999: 172).

As pre-listening activities, Sarıçoban (2000) recommends discussing the theme, the title or the story of the song if there is one, informing students about the lingual points to be studied and using a picture to introduce the theme of the song.

Moreover, many activities such as predicting the theme of a song out of its title, putting the lyrics of a song in syntactical order, involving posters about the song and the singer and with the aim of raising awareness, asking students whether they have background knowledge about them and if the song has a video clip, playing it silently and asking students to make predictions about the theme of the song can be utilized in this stage.

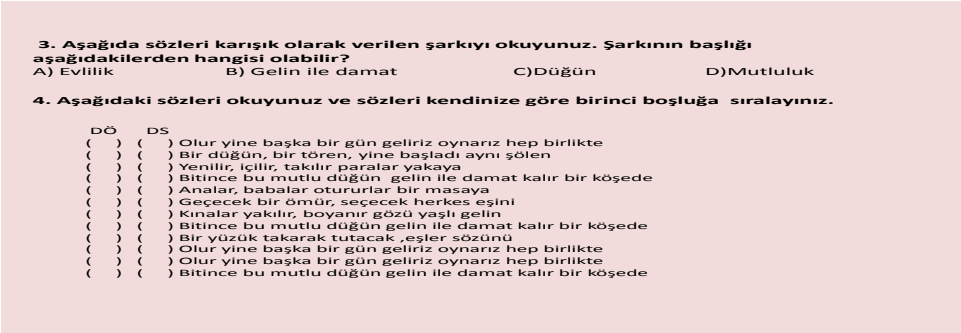
An example from an application regarding how to make use of a song of which theme is wedding ceremony, which is a cultural element, in Turkish as a foreign language classes is given below. In this application, the first step consists of pre-listening activities composed with the purpose of familiarizing students with the text.

Activity 1: What do the pictures remind you?

Activity 2: Write down the other words you have in your mind about marriage.

Activity 3: Read the disordered lyrics of a song below. Which of the options below can be the title of the song?

Activity 4: Read the lyrics below and order them for yourself by writing the numbers in the first gap.


3. Aşağıda sözleri karışık olarak verilen şarkıyı okuyunuz. Şarkının başlığı aşağıdakilerden hangisi olabilir?
A) Evlilik B) Gelin ile damat C)Düğün D)Mutluluk

4. Aşağıdaki sözleri okuyunuz ve sözleri kendinize göre birinci boşluğa sıralayınız.

DÖ DS
( ) ( ) Olur yine başka bir gün geliriz oynarız hep birlikte
( ) ( ) Bir düğün, bir tören, yine başladı aynı şölen
( ) ( ) Yenilir, içilir, takılır paralar yakaya
( ) ( ) Bitince bu mutlu düğün gelin ile damat kalır bir köşede
( ) ( ) Analar, babalar otururlar bir masaya
( ) ( ) Geçecek bir ömür, seçecek herkes eşini
( ) ( ) Kınalar yakılır, boyanır gözü yaşlı gelin
( ) ( ) Bitince bu mutlu düğün gelin ile damat kalır bir köşede
( ) ( ) Bir yüzük takarak tutacak ,eşler sözünü
( ) ( ) Olur yine başka bir gün geliriz oynarız hep birlikte
( ) ( ) Olur yine başka bir gün geliriz oynarız hep birlikte
( ) ( ) Bitince bu mutlu düğün gelin ile damat kalır bir köşede

The aims of these activities are to motivate students for the text and the lesson and to have them brainstorm about the text, by providing them with some ideas about the theme of the text before encountering it, since students may fail to focus on or be motivated for the text if they directly face the text without having any preliminary activities.

4.2. Listening Activities

Listening activities are directly related to the text and students are expected to carry out these activities in the course of listening. In this process of listening and by the guidance of the teacher, students control their comprehension skills and focus on listening to the text.

According to Peachey (2003), in order for students to get accustomed to the voice of the singer or the tempo of the song, they need to listen to that song at least for three or four times. Prior to listening, it is also necessary to grant students with a short period of time for reading the questions they are going to answer while listening.

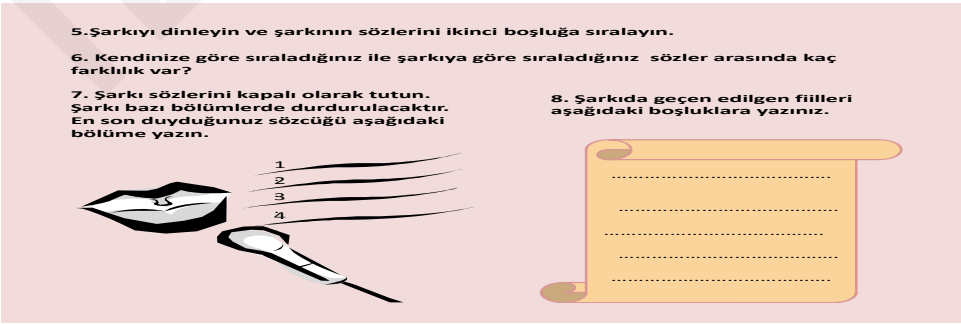
In this stage, activities such as removing certain parts of the text which are related with the grammatical form, word or pronunciation type in question, checking the accuracy of the predictions made about the song before listening, ordering the lyrics of the song, answering multiple-choice or open-ended questions about the song, picking the words that students hear in the song from a long wordlist given before listening, pausing the song and asking students to repeat the last word they have heard or correcting lexical, grammatical or syntactical mistakes deliberately involved in the lyrics.

Activity 5: Listen to the song and put the lyrics in order using the second gap.

Activity 6: How many differences are there between your order of lyrics and the order you have had after listening to the song.

Activity 7: Don't look at the lyrics. The song will be paused at certain parts. Write down the last word you have heard.

Activity 8: Write the passive verbs you have heard in the song in the gaps below.


5.Şarkıyı dinleyin ve şarkının sözlerini ikinci boşluğa sıralayın.

6. Kendinize göre sıraladığınız ile şarkıya göre sıraladığınız sözler arasında kaç farklılık var?

7. Şarkı sözlerini kapalı olarak tutun. Şarkı bazı bölümlerde durdurulacaktır. En son duyduğunuz sözcüğü aşağıdaki bölüme yazın.

8. Şarkıda geçen edilgen fiilleri aşağıdaki boşluklara yazınız.

1
2
3
4

In the activities presented above, the aims are to have students check the predictions they have previously made about the song, develop their listening and comprehension skills and internalize the grammatical structure they have learned. In this process, students are more into production. In this stage,

the emphasis is on how and with which elements students should approach texts in order to develop their comprehension skills. It is expected from students to carry out verbal and written tasks by sticking to the text and to progress the way they use the language from dependent to independent by dealing with the text in question with its various aspects.

4.3. Post-listening activities

Various activities for assessing the whole process of listening can be conducted in this stage. According to Davenellos (1999: 14), this stage consists of follow-up activities for developing speaking and writing skills.

In this stage, Sarıçoban (2000) recommends using activities such as reading a text about the singer or the theme of the song, commenting and interpreting the song and dramatizing the plot of the song. These activities may vary in accordance with the language level and the areas of interest of students. The teacher can check the answers of the questions from listening stage. For improving writing skills, students can compose a dialogue out of the words of the people in a song; they can summarize, continue the song, or rewrite the lyrics from the point of view of another person in the song. In order to improve pronunciation, students can sing the song individually, with another student or in groups. For improving speaking skills, students can talk about how they feel after listening to the song. Also, some questions can be directed to students with the aim of initiating discussions.

Activity 9: According to the song, what kinds of activities are there in a wedding ceremony? Summarize them.

Activity 10: What kinds of activities are there in a wedding ceremony in your country? Compare them with the activities mentioned in the song.

With these activities, students are expected to summarize the song, to practice writing by involving his/her culture in the class and using the lingual structure he/she has just learned. Students are more into production in this stage. What is expected from students is to carry out verbal and written tasks by sticking to the text and to progress the way they use the language from dependent to independent by dealing with the text in question with its various aspects. In the activity on the final step, lesson topics are quite flexible. The lesson is drawn away from fictional contexts to daily life. Students are expected to state their thoughts without depending on the text.

5. Conclusion and Recommendations

There are positive and negative views on the utilization of songs in foreign language teaching. It is seen that songs are used for many reasons by methods adopted in foreign language teaching. The facts that music soothes students and that melodies, rhythms and rhymes in a song facilitate language learning improve students' reading, writing, speaking and listening skills. Besides, music and songs are all authentic texts. These authentic texts act as significant sources for students to discover the culture of the target language and to improve their cultural awareness. In this study, which was carried out by taking these effects of songs as basis, activities that can be used with songs in Turkish as a foreign language classes are given and certain sample activities are recommended.

For foreign language teaching, if songs are carefully chosen by taking the audience, objectives, language level of students and song content into consideration and if deliberate activities are carried out, it is possible to make use of songs effectively. Utilizing songs this way provides an enjoyable experience not only for students but also for the teacher. Using songs along with such activities will have many advantages such as saving the lesson from being boring and monotonous and improving student motivation.

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VIRTUAL COMMUNITY LET'S TAKE CARE OF THE PLANET

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Abstract

This is the record of the activities held inside the *Virtual Community Let's Take Care of the Planet,* an internal project of the *Child-Youth International Conference Let's Take Care of the Planet*, it was executed by invitation from Brazil's Government, and brought about 600 young representatives from 47 countries, held in Brazil in June of 2010. The process of National Conferences in theses countries involved directly 85,258 schools and 13,153,229 people around the world and had as a final product the *Charter of Responsibilities Let's Take Care of the Planet*, written by those young delegates. The Charter suggests and guides global socio-environmental actions from local discussions and indications. This report introduces, in a general way, the steps of the conception, implementation and management process of the Virtual Community, which is a space built in the Internet for this world process and it has as goal to agglutinate the discussion, to exchange and register the International Conference process.

Key words: Internet; Environmental Education; Virtual Communities; Educommunication

Introduction

Environmental Education policies in Brazil are made and implemented by the General Coordination of Environmental Education (COGEA), which is composed by the Ministry of Education and the Ministry of the Environment. One of the actions of the COGEA is the Child-Youth National Conference for the Environment, which involves the school community in discussion about socio-environmental subjects to subsidize public policies in Environmental Education. From a constructivist and participative management process, the Conferences gather children and youth who research, identify socioenvironmental problems, take responsibility and propose local actions, and choose representatives who take the consensual ideas to other spheres. The representatives of all Federative Units elected by the youth get together in Brasilia (Capital City of Brazil) to compose the Charter of Responsibilities, which manifests discussions all over the country – this Charter is delivered to the Federal Government and then actions are initiated at the schools.

There has been three National Conferences: the first, in 2003, it got 15,452 schools and 5,658,877 people involved all over the country; the second in 2006, 11,474 schools and 3,801,055 people participated; the third, in 2009, 11,670 schools and four million people participated. Theses Conferences integrate the *Let's Take Care of Brazil* Project with the schools, public policy for which Environmental Education makes a

> […] commitment with changes of values, behaviors, feelings and attitudes, which must be done with the total inhabitants of each territory base, in a permanent and continued way for every one. An education which proposes the fomentation of continued processes that enable the respect for the biological, cultural and ethnical diversity, as well as the strengthening of the society resistance to a devastating model of human relations with themselves and with the environment. (Trajber & Sorrentino, 2007, p. 15).

A proposal from international observers who attended the II National Conference brought, in 2010, the International Conference Let's Take Care of the Planet (CONFINT), hosted by Brazil. Fifty-two countries, by invitation of the Ministry of Education of Brazil, organized National Committees in order to coordinate nationally the process at the schools. The process got 85,258 schools and 13,153,229 people involved around the globe. According to the General Coordinator of the International Conference:

> The Children and Youth International Conference for the Environment is included in the framework, mission and goals of the UN Decade of Education for Sustainable Development (DESD), 2005–2014. The main themes of the Decade are citizenship, community values, diversity, interdependence, sustainability, quality of life and social justice, all of which correspond to the goals of the conference. However, above all, the conference seeks to contribute to the incorporation of a new generation that constitutes a large portion of humanity and that is traditionally thought of as the future but that nevertheless lives, thinks and acts in the present. (Trajber, 2010, p. 76)

Delegates of age from 12 to 15 years old, from 47 countries, *were in Brazil in June 2010,* for the final step, which gathered 600 young people. As a result of the five days of interaction and discussion, the *Charter of the Responsibilities Let's Take Care of the Planet* was written by the delegates. It can be seen

at the following web address: http://carta.vamoscuidardoplaneta.net/en/.

The *Virtual Community Let's Take Care of the Planet,* the subject of this paper, is a space of registration, attendance, proposition, and continuity of this international process. The appropriation of the New Information and Communication Technologies establishes the possibility of a new mobility of interactive multidirectional and decentralized non-presence communication – a net communication. Thus, the Internet brings people who are geographically apart together, ignoring the boundaries of time and space, hierarchical structures, allowing the interactivity in real time, permanent update and immediate, dialogical and global access. So, physical-space-independent communities are brought up. When we think about virtual communities, we think about new places of interaction among people, making our social reach wider.

The virtual communities, with the intention of working systematically with teaching/learning or not, are non-formal and informal educative spaces. A Virtual Community is the gathering of people around the same interest, through the internet: all the participants are willing to learn, teach and share about the same subject and the mediation guides the activities upon this.

Partnerships and goals

The Project *Virtual Community Let's Take Care of the Planet* is a result of a partnership among Secretary of Continued Education, Literacy and Diversity (SECAD) of the Ministry of Education (MEC) and the Federal University of São Carlos (UFSCar), *campus* Sorocaba, Brazil.

The Federal University of São Carlos was created in 1968. It is located in the State of São Paulo and it is divided in three *campi*, of which the newest one is located in the city of Sorocaba (80 km distance from the Capital City of the State of São Paulo), and it has a general principle of Sustaintability. This *campus* holds activities linked to teaching, researching and extension that work in a systemic way in the environmental, educational, economical, social and cultural spheres looking towards a sustainable society. The proposal of a partnership with the Ministry of Education in this project has as basic principal the recognition that, in building a sustainable society, the preventive actions are more important than mitigable or adaptive actions and may the real preventive action be the *education to sustaintability.*

The general objectives of the Virtual community are: to give the participants an integration, discussion and composing environment; to advertise the *Charter of Responsibilities Let's Take Care of the Planet,* to follow the actions started from the Charter in the signatory countries; to bring reflection and dialogue upon the themes proposed in the International Conference and the educative process of the mediators students in the Community.

The result of this process, which can be seen at www.letstakecareoftheplanet.net, is managed in the open code platform WordPress MU (multi-user), using the plugin BuddyPress to implement the social network and it is involved in all the four official languages of the Conference: Portuguese, Spanish, French and English.

Methodology

Once the partnership and goals established and the project inserted in the bigger project of the International Conference, the *conception and implementation* of the website step started. Theses two steps, although may have the major part of its execution done, still reflect and are reflected by the current step, that will be called *mediation.*

For the conception and implementation of the Virtual Community Let's Take Care of the Planet people who had knowledge in communication management, group mediation, social network and free software, National Conference process and Educommunication formed a work group. This group, which includes UFSCar's Professors and specialized companies, initially held the activities described in this paper as: creation and organization of a website structure; development platform definition; preliminary research of material referring the International Conference; confection of specific content for the Community; definition and hiring of a hosting plan; data bank management; selecting and configuring Wordpress and plugins; researching and installing plugins and sequence tests to answer the demand and stability; layout execution from the existing CONFINT visual identity; dominium and hosting of the websites in all the four official languages. At the same time, a propagation strategy was developed and a connection with other participating countries was established in order to incorporate materials, experiences, addresses and information.

The project's management structure was developed from two supplementary and inseparable coordination groups: Ambience Coordination (dedicated to technology matters) and Mediation

Coordination (dedicated to the group responsible for the interaction and maintenance of the Community).

The Mediation Coordination was held by group composed by UFSCar professors and students and by a mediation specialized and Communication production company. The Virtual Community mediators team was initially composed by ten selected UFSCar-Sorocaba students, having a criteria the proficiency in the International Conference official languages, also found in the Virtual Community websites – Portuguese, Spanish, French and English.

Pedagogy, Biology, Geography, Tourism and Computer Science Undergraduate students compose the mediators group – it has attended to a capacity meeting with the purpose of introducing and integrating the group, understanding the project and its history, understanding its configuration and the whole group's function involved in this project. The Ambience Coordination held a capacity meeting concerning the usage of the system, general introduction of the platform, the usage of WordPress and the deepening of specificities of the tools involved in this project – content insertion, mediation and action as multipliers, aiming to stimulate the participation of new users thru the social network.

Later, thru weekly virtual meetings, the Mediation Coordination and the UFSCar's mediators interacted constantly to solve doubts, plan new implementations, report possible flaws and enhance other processes involved in the website updating dynamic.

Mediation had the principle of participative management. Throughout the project, the group was made author, sharing decisions, needs, difficulties and achievements. The principle of the self-summons was incorporated to the organization of work, allowing each participant, over time, to find out more activities with which they would sympathize the most, other than the ones needed to meet the updating flow of the Community. Thus the method of work led the mediators to

> Being responsible for the French language, turning me into author, creator and translator, allowing me to suggest any subject related to the Community and the languages inside the virtual work. (R. Castro, personal report, June, 2010).

The Mediation Coordination established as uneventful weekly meeting attendance, and virtual meetings during the holiday seasons took place thru tools such as *G-Talk* and *Skype* (a valuable experience that enriched the work with virtual interaction that the project required). At times, the meetings were held on Saturdays to ensure the presence of every one for a longer period of time.

> Because we attend to present weekly meetings, we don't spend too much time without gathering. Sometimes we meet on times other than the meeting, once we're no longer only colleagues, we also became friends. Sometimes, we also hold virtual meetings thru Skype or Gtalk, especially when we can't meet in person. Every meeting has its agenda. The most common subjects are about the homepage update, community projects, problems on the website, and appointments outside the University etc. During the meetings, one of the mediators is responsible for registering the agenda, and then, after the end of the meeting, he or she sends it to the others. (L. Oliveira, personal report, November, 2010).

The tasks carried out routinely throughout the project, described in general terms are: daily mediation of the Community; collecting and selecting continued content; observing and inserting other similar networks; development of promotional material; implementing tools suggested by users; material production – text, audio, video; technical support and Virtual Community website maintenance, interaction with the participants of the Community and a similar material research.

The group's first activity happened in the week following its formation, during the European Conference, a preparation to the encounter in Brazil. The group of mediators attended a meeting via Skype with the organizers in order to learn about the tool that was going to be used and also the translation dynamics and the Conference's interactions, which happened entirely virtually.

> Several young people participated with questions, answers, suggestions, experiences, among other things, so our job was to translate these ideas and eventually give some opinion and publish in the Community. (…) The European conference allowed me to open my mind at once and to see how aware of the subject the youth is, how seriously they take it and how much I have to enjoy this opportunity so I can grow up and learn more. (T. Santos, personal report, May, 2010).

This work, despite the little time have known each other and the project itself, had the following evaluation from one the organizers of the European Conference:

> Dear all, as you can see the exchanges are so many and so interesting, and their flowing is so good, thanks to the whole teams of translators and experts, so again, I AM IMPRESSED BY THE WORK YOUR DOING ALL, GREAT!!! No specific remark a part from keeping being so good and flexible all of you!! Any question you would like to raise, let me know! (L. Nicollet, in personal communication, May, 2010).

In addition to the established routine work, we highlight the following activities that also brought autonomy, reflection and authorship of the whole group of mediators.

Activities held during the Conference

Throughout the project, some activities were delineated from the ongoing assessments made by the group on its own work and from the demands/ opportunities arising in the Community. One of the most important terms of maturity of the group, experimentation and knowledge of the reality-focus of the project and appointing the new language/ tools for the virtual space was the attendance to the final phase of the CONFINT, held from the 29th of May to the 11th of June, 2010. Mediators and coordinators of the virtual community were involved in this present moment, in Luziânia (State of Goiás, Brazil).

The attendance aimed to promote the Virtual Community and to produce some material about the event in order to publish in the Community – this communication production, held under the Educommunication perspective, had as partnership the conceptual and methodological formation the non-governmental organization the *Cala-boca Já Morreu Project,* also responsible for the Educommunication are of the CONFINT, and also of the National Conferences.

Educommunication is a new knowledge and social intervention area that combines characteristic features of Education and Communication. The educommunicative practices use languages and technologies such as computer, internet, radio equipment, video, photo, or anything else, so that people will turn information consumers to information producers. This change, besides providing a democratization of the means of communication, strengthens the participants as individuals and as groups. Combining the educommunicative practices with Environmental Education added orientation to the Environmental Education General Coordination in Brazil. This orientation is explained by the fact that we learned that in the

> Building of environmental knowledge, the use of the languages and communication technologies was crucial to form the public opinion and our acquaintance about the subject. Environmental Communication pervades corporations, governments, nongovernmental organizations and Universities; it is present on the television, radio, newspapers and environmental networks formed around the world thru the internet (Lima &Melo, 2007, page 173).

and

> we also can be producers of this knowledge, inside a reality about which we reflect and only we understand (…) and publishing our knowledge has to do with using social communication languages: the radio, video, newspaper, handout, , the internet – whatever is available to any of these medias or to our access to the production of each one of them. (IDEM).

The Communication production perspective enabled the Virtual Community to directly participate of the all the three following activities.

Journalistic coverage of the event: producing and publishing the content – Seven audios, 20 videos, 12 texts and five photo albums were produced and published, in addition to the collection of material produced by the participants to the *decoupage,* editing and publishing in the Virtual Community.

Journalistic Coverage Workshop: offered in Portuguese, English and Spanish with six international facilitators and 33 delegates as participants, it was coordinated by the group. Five videos and 17 radio shows were recorded and then made available in the Virtual Community.

Live webcast: in order to share important moments of the Conference, 12 hours of important moments of the CONFINT (Opening Ceremony, Culture Festival, Reading of the Charter of Responsibilities and of the Musical Charter, Closing Ceremony at the National Museum, in Brasilia, as well as five other programs produced with delegates, chaperones and CONFINT organizers) were webcasted. The group was responsible for the implementation and management of the webcasting interface, which included a flow tool of *Twitter.*

> During the CONFINT I was surprised by myself. I became more active, didn't have to wait for others to tell me what to do, but I did it by myself. I believe CONFINT was an unforgettable experience, the cultural exchange was huge, I've deepened on the project, and I saw how engaged the other countries are, doing what is possible to have their youth learn. I wrote articles, made interviews, took photos and even made videos. (Vanessa Ito, Portuguese mediator, Geography student, personal report).

Besides the activities linked to Educommunication, the group also participated as language facilitators (youth who accompanied the delegations as translators) of the delegations of Egypt, Nepal, South Africa, Sri Lanka, Guatemala and French Guiana.

The people responsible for Community technological mediation followed the event aiming to assure the proper functioning of the website, to implement demanded improvements and to enable the live webcast, especially concerning the infrastructure (network and transmission settings).

Another demand from this moment was the *Charter of Responsibilities* space in order to publish and disseminate the Charter in all the four official languages, as well as the possibility of interaction so

ideas on how to disseminate the Charter of Responsibilities and to implement action would be registered. The blog also counts on the *Promote the Charter* tool, which helps the users to spread the Charter among their contacts. An online petition was created to enable internet users from all over the world to subscribe to the document.

After-Conference Activities

In July 2010, a weekend-long meeting appointment was dedicated towards the partial assessment of the project and to the planning of action for its continuity. Strengthened by the familiarity and by the work done during the Conference, coordinators and mediators began to add new activities to the routine activities, like the following ones.

Tutorials: tutorials on how to sign up, to blog and to join the groups were created. They were made by mediators as Screencasts. The Activity demanded an itinerary preparation, the used application mastering and translations.

Live Webcast: a pilot show was held in October and it evidenced the possibility of the Virtual Community start to broadcast TV shows produced by local groups, without the need of very sophisticated technologies. The mediators made the screenplay and broadcasted the Show live from the Pedagogy Laboratory of the Federal University of São Carlos, Sorocaba campus. An area in the website was developed with a proper interface so that the transmission player could be incorporated, using the free service *Ustream,* properly settled by the UFSCar team.

Bulletin: design development and programming bulletin with the possibility of text, audio and video0 insert. The *MailChimp* remittance tool settlement and full autonomy to insert content, the mediators group began their own to activate the subscribed users on the website thru the regular remittance of information.

Pilot Videoconference: the participation of the Environmental Education General Coordinator of the Ministry of Education, Rachel Trajber, the Brazilian group was formed by the mediators of the Virtual Community and 20 teachers and students of the Laranjal Paulista town, which recently held Municipal Conference *Let's Take Care of Laranjal.* Inserted in the MEC's Environmental Education public policy, this Conference is an extension project from the UFSCar-Sorocaba as well.

New Homepage: a new homepage was created from the suggestions of the group, during the assessment in July.

PICTURE 1 – with the restructuring, the homepage of VCP now operates more dynamically, allowing highlight content from various sources on the platform and showcasting the latest updates made by the users

The act of "doing" in the group was closely linked to the act of "thinking" the project and its own action, for that the meetings to conceptual and methodological deepening also contributed. As an instrument to register the individual processes, each mediator produced a report of their activities every month, in which report reflections were incorporated throughout the project. A Virtual space is being organized in a collaborative manner to bring together the reflexive texts that have been made by the group.

The following Academic Productions were produced and presented in 2010:

- During the *I Scientific Journey UFSCar Campus Sorocaba,* panels from mediators Romina Daisy Castro Rojas – *Facilitadores de la I Conferencia Internal Infanto Juvenil por el Médio*

Ambiente Cuidemos el Planeta and Samuel Coelho - *Oficinas de Educomunicação para a discussão e difusão de ações socioambientais globais.*

- Mediator Lívia Souza formulated her Completion of Course Work in which she analyses the responsibilities taken by the participants of the International Conference, as title *Vamos Cuidar do Planeta – Como? (Let's Take Care of the Planet – How?)*

The participation on the project the possibility of acting, for 15 days, in a world encounter with adolescents and youth allowed an academically meaningful experience to the mediators-students from UFSCar. Once the only criteria to the selection was the proficiency in a second language, it was made possible to each participant to deepen in themes such as communication technologies, social networks, environmental and cultural matters, communication production, management models, group relation – important matters to graduation training, no matter which.

A few considerations

This experience report was written before the end of the Project (31st of March 2011) and it will be necessary a larger period apart from the process so the reflections about the many possible interfaces presented throughout the work.

The issues related to the "vocation" of the Virtual Community, built in their interaction with the participants – originally conceived as a Learning Community and later settled as a Social Network. The practice pointed a few constraints and new possibilities, reorienting the meaning of the space.

One of these constraints concerned time – we treat different school time in the involved countries, as well as the different times of digital inclusion of the delegates of the CONFINT around the world. Thus, if a Learning Virtual Community has as differentiating factor pedagogical "intentionality", the assumed actions to this purpose need to be carefully built and proposed at a different pace – it is not possible to propose "steps" to be threaded together if not everyone has the same footsteps pace.

On the other hand, although the Community has the architecture for the possibilities of a Social Network, it "competes" with world social networks such as Facebook, Orkut and Twitter – The International Conference Let's Take Care of the Planet has it spaces in these networks, organized and fed by the participants. At the first look, we consider the local action as being more important campus than the global perspective, at this moment, for the lack of a gathering action on a planetary sphere.

Thus, at this moment of the still superficial assessment of the project, we reckon that the Community met its focus from two acting spheres: the proposition of new manners of interaction in this virtual space and research, organization and publication of the countries information about the continuity actions. We can state today that the *Virtual Community Let's Take Care of the Planet* is the space on the internet that gathers the most information of productions of the International Conference Let's Take Care of the Planet.

Acknowledgements

The Ministry of Education of Brazil, for making the project possible
Adriana Murari, for helping to translate the text into English

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VIRTUAL LEARNING ENVIRONMENT USAGE: PREVIOUS EVALUATION OF E-TRAINING PROCESS WITH BRAZILIAN PROFESSORS.

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ABSTRACT

In Brazil, there are recent governmental policies to encourage implementation of e-learning as an alternative to improve the population education. One of this actions is being developed by University of Brasília/UnB which coordenated 23 projects of different academic sections. In Life Sciences, our team is involded in e-learning object development and a website; a course which integrates genetics and movies; and finally, an e-training process with our professors as a support in their undergraduate classroom courses. Related to e-trainning, 42% of our department are developing their own VLEs with our tutoring. Besides extensive tutoring, professors are showing preference in VLEs usage as a file library and they avoid virtual tests. We reflected that it is a matter of time and they will obtain command and security in the application of various resources and virtual tools in order to develop their VLEs.

INTRODUCTION

In Brazil, there are recent governmental policies to encourage the implementation of e-learning as an alternative to improve the population education. As an example of a government program we can cited "Universidade Aberta do Brasil-UAB" (www.uab.capes.br) which is a system created in 2006 and organized by public universities that mainly offer on-line college courses for brazilian people who have limited access to high education in the classroom module. In the context of the UAB, our team is linked to an enterprise to promote e-learning practices by professors in undergraduate classrooms. Since August 2010, University of Brasília/UnB coordenated 23 projects developed by different academic sections. In Life Sciences, our team is developing an e-learning object in genetics and a histological website www.histologia.unb.br; a course which integrates genetics and movies; and finally, an e-training process with our professors as a support in their undergraduate classroom courses.

The Department of Genetics and Morphology-GEM is composed of 22 permanent teachers and offers, in average, 27 courses/per semester to undergraduate students in a traditional way. Our university offers a virtual learning environment-VLE called "Aprender.UnB" based on Moodle software. In 2010, analyzing Moodle software usage by GEM teachers, we checked 20 VLEs. A careful analysis resulted some findings: (1) 8 VLEs were related to undergraduate courses; (2) 12 VLEs were related to research projects and others were VLEs created but not in use and (3) only 4 teachers are responsible by those 20 VLEs. With only 16% of teachers using e-learning resources, despite the fact that "Aprender.UnB" offers Moodle tutorial and online courses, we detected need for professional improvement.

METHODS AND PROCEDURES

INTERVIEWS

Semi-structured interviews were prepared to able us to understand teacher relationship with technological resources available in working place and outside it; to gather their views on e-learning; to know whether he/she had participated in any online course and, after more detailed explanations about the project, to encourage each one to participate in e-training, because it was based on voluntary adherence.

TUTORING

The 3 (three) tutors selected to attend e-training process are high school teachers, two biologists and a chemist. One of them, in addition to Biology, also has academic background in computacional field and e-learning experience as a student. The other ones had recent experience in using Moodle software. A prior training of these professionals was conducted, giving them opportunity and autonomy to continuously improve their Moodle knowledge. Step-by-step instruction files were developed by this group and are being applied with participants. Team meetings are held monthly to share individual experiences, to appraise activities, to discuss e-learning topics and to improve our team relationship.

E-TRAINING DESIGN

For each GEM teacher was provided a VLE in "Aprender.UnB" and appointed one tutor to accompany activities development until July/2011. The main goal is to prepare a VLE with freedom, aiming a product: a VLE as a support for an undergraduate classroom course. This strategy was used because our public is too busy with a diversified routine work. For these reasons, we did not opted for a collective process e-training but an individual one which each teacher could operate in a particular time elected by him/her. Interactive tasks are being stressed during e-training and stimulated to be used in VLE course with students.

RESULTS

E-TRAINING ADHERENCE

Although all interviewed professor (16) have joined to training process, just ten (10) are at final stage. Our team was very persistent in contact and encourage those 6 absent teachers, even no responses were obtained to explain their withdrawals. Thus, we speculated upon their reasons. It remained us a reflection on participants profile, their pedagogical background and their working routine. GEM professors are biologists, in majority, with only one with formal teacher training course (undergraduate degree). Master and PhD´s were obtained by research lab work in molecular biology, cell biology, histology or other biological field. As it was common in Brazilian universities (in present time, postgraduate courses have teaching training for masters and doctoral students), we have a group of professionals who have learned to be a teacher when they take a career at a university. These people are fitted in a cartesian curriculum, where pedagogical strategies are not discussed. During their student time, a majority had a cartesian academic preparation, with endless lectures and/or practices focused in teacher and overhead projectors. And as we note, they repeat this model.

The fact is that, in most cases, even with the rich experience gained over the teaching years, they continue to focus learning process on teacher and lectures, using Powerpoint slides (as substitute for considered old fashion transparency). This teaching model is rooted and the fact that undergraduate courses are face-to-face can be an obstacle for the professional to perceive virtual resource as a need, despite claims to the contrary when interviewed. Added to this set of features, we include professional self-interest and his/her list of priorities in the work routine.

However, the rate of 62% effective training is considered a success by our team. Of our 10 participants, 5 are involved in posgraduate programs, with two of them involved in a posgraduate program focused on science education. During e-training, three participants are acting, like virtual teachers, in Biological Science e-Learning graduate course supported by UAB and UnB.

e-TRAINING DEVELOPMENT

In contact with participants, the tutors have experienced different situations, with teachers who want frequent face-to-face training compared with participants who sporadically make questions (by e-mail or phone) about some aspect of Moodle. But we understand that each situation must be considered carefully and we do this on items related to e-training process.

VLEs as a file library

Without no one exception, VLEs of participants are being used, in priority, for files uploads and downloads such as slides classes and papers for a complementary reading or face-to-face seminars. Even

encouraged by tutors and learning to use tools and diversified resources, few participants make use of them.

The arguments, while clearly explained by participants, are related chiefly to time management at work. Some participants just do not want to increase the time they spend in front of a computer. Others argue that holding a forum, for example, would result in more work outside the time allotted for the undergraduate course and professional agenda is full of other obligations. We understand that e-learning is still a new experience in brazilian education system and a number of adjustments are being necessary to encourage teachers to explore the possibilities that a virtual environment gives use even like a support. We are aware that a professor career in an university requires professional involvement in administrative matters (such as heads of sectors, for example), economical issues (competition for financial supports and research labs management), scientifical issues (undergraduates and postgraduates students demands) in a diverse routine. Teaching activities have to fit into this day-to-day.

How to encourage these teachers to further explore a VLE potential in this panoram ? On curriculum matrix in which they are inserted, it still officially allowed to transfer 20% of meeting time to a virtual classroom. But we know that any activity in this virtual context, in fact, gives extra work. But given the current reality, our team is showing alternatives for participants, encouraging them to diversify resources and tools usage to provide students with exercises and tests.

VLE tests

Our findings include a resistance to insert virtual activities that compute in the final grade of each student. The arguments of the participants are related to the fear of plagiarism and the uncertainty about work authorship. Regarding plagiarism, we are convinced that it is an old problem in any school environment, and only aggravated by the fact that student has the information more easily via world wide web. In brazilian education system, it is common that the teaching and learning process is focused on content, with the student acting just as a receiver of information, with emphasis on memorization process. We considered that plagiarism has a direct relationship with an education system that trains students who read little (with a estimate of 4.7 books per year/per Brazilian student, including school books) and are little encouraged to develop their skills. We consider this problem without a solution until a radical change in the brazilian educational system takes place, which should help, in fact, the formation of citizens who are critical readers, enjoy reading, know to look for relevant information and know how to write with quality. We are conceived of a VLE can even help much in building this citizen, with the inclusion of activities that typically would not are applied in personal meeting because of lack of time. Regarding work authorship, a clear preference of teachers to conduct face-to-face tests are noticed, but we reflected that it is a matter of time and with improvement of teacher's relationship with the VLE they will obtain command and security in the application of various resources and virtual tools in order to develop qualified evaluation methods in a virtual environment.

Finnancial support:
BRAZILIAN MINISTRY OF EDUCATION/MEC www.mec.gov.br
UNIVERSITY OF BRASÍLIA www.unb.br

Virtual Space as a Learning Environment: Two Case Studies

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Abstract
This paper addresses the issue of using virtual spaces as a learning environment. With the advances in e-Learning systems, the education community shows a growing interest in using online tools for educational purposes. The case studies presented in this paper demonstrate how a 3D Virtual Environment can be used as a learning tool by providing a virtual space that (1) allows people in different locations to interact, (2) gives users access to facilities not available physically, (3) enables activities that are not possible in physical settings, and (4) offers a variety of observation and measurement tools for performance evaluation and improvement. We demonstrate these advantages through two case studies that offer a framework for language learning for English as Second Language students and a simulated archaeological excavation site for History students, in the context of Carleton Virtual, a 3D virtual environment for Carleton University. Based on the results that show the advantages of using the virtual space as a learning environment, we argue that Virtual Space can be a new framework for learning.

1. Introduction

Providing universal world-class education and an innovative research environment, especially in a country as vast as Canada, requires prohibitive investment in resources to provide students and researchers with multiple physical spaces and environments suited for experimentation and collaboration. For example, physical facilities and spaces such as research labs and university campuses are location-dependent and only accessible to those in that geographical location. Likewise, some training and research activities require the development of complex simulated environments that are either too costly or impossible to arrange (e.g. training emergency personnel on handling major disasters). In addition, it has been recognized that innovative work requires collaborators to share tacit and explicit knowledge freely which requires the rich communication usually associated with face-to-face interaction, enabling people to transfer individually-held knowledge, and synthesize it to fashion new collective knowledge.

Digital media (i.e. computer-based systems) have been widely used to improve the educational and research experience by providing new means of processing and sharing information. However, while traditional information and communication technology (ICT) tools such as websites, email and messaging systems, have contributed to the speed of communication and dissemination of information, their ability to support knowledge creation and assimilation is still limited. Traditional ICT strips away the nonverbal cues that clarify messages, and does not provide the physical and linguistic "co-presence" that face-to-face communicators use to draw inferences about one another's knowledge [1]. Traditional ICT tools are also limited in their ability to simulate real-world experiences, critical for the assimilation of complex concepts.

Three-dimensional virtual environments (3DVEs) are graphical environments resembling 3D spaces where users control computer-generated characters (avatars) that represent them, while interacting with the environment and other users, and possibly with computer controlled characters. 3DVEs can contribute to an educational and research system by facilitating communication, collaboration, and simulation. 3DVEs provide an electronic surrogate for face-to-face interaction and allow the creation of simulated environments and experiences otherwise not possible due to high cost,

physical or logistics constraints. By providing a platform that closely resembles physical interaction, 3DVEs permit interaction with a computing environment and the work of other users, while creating the perception that one exists within the environment.

As discussed in the next section, various researchers have explored the advantages of 3DVEs as educational tools, but current 3DVE research and related technology still suffers from the lack of some particular features such as:
1- A thorough study of the advantages and applications of 3DVE technology
2- Advanced intelligent functionality such as dynamic content, integration with other tools, and performance evaluation tools
3- A new educational paradigm based on "virtual spaces"

In this paper, we present two case studies that together demonstrate general advantages of 3DVE technology. These two cases are a framework for language learning for English as Second Language students and a simulated archaeological excavation site for History students, both in the context of Carleton Virtual, a 3D virtual environment for Carleton University. We demonstrate that 3DVEs can be used as a learning tool by providing a virtual space with following advantages:
1- It allows people in different locations to interact.
2- It gives users access to facilities not available physically.
3- It enables activities that are not possible in physical settings.
4- It offers a variety of observation and measurement tools for performance evaluation and improvement.

The projects introduced here are part of a series of research project that together try to address the three missing features mentioned above. We briefly introduce our framework which already provides some of those advanced functionality. We also discuss our initial ideas on the educational paradigm based on virtual spaces. In the next section we review some related work. The general structure of our framework and particular structure and results of two case studies are the topics of the next sections. Finally, we will provide a discussion and some concluding remarks.

2. Related Work

Researchers have studied these virtual environments for education and health care. Davis et al. [2] proposed a community building approach for cancer patients, while Curran et al. [3] describe the Town of Mirror Lake, a virtual community for educating nurses and medical staff. Most of these researchers have noted that virtual communities have become more and more popular thanks to the familiarity of users, particularly younger generations, with digital online media. Second Life (http://www.secondlife.com) is a 3D virtual environment that has been widely used for social, educational, and commercial purposes. Twinity (http://www.twinity.com) and IMVU (http://www.imvu.com) are two other examples of virtual environments that target reconstruction of real cities and creating social meeting places, respectively. Boulos et al. [4] have provided a good review of potential uses of Second Life and other 3D virtual environments for health and medical education. They argue that 3D environments provide an immersive realistic experience that can combine communication, entertainment, training, and access to a variety of data types. On the other hand, serious and educational games, and the effect of story-based learning and empathic virtual characters have been studied by different researchers such as McQuiggan et al. [5] and Kenny et al. [6]. Other researchers [7] have tried to focus on the issue of community members and how they can differ based on gender, age, and race, and require different treatments.

Callaghan et al. [8] also report the use of Second Life for technology education. They notice the need for some simplifications (for example in teaching engineering equipments) which can be a problem but also mention partial integration with a content management system (Moodle) which is a considerable advantage. Danilicheva et al. [9] explore the educational values of 3D virtual worlds but from a storytelling point of view. Their work points to the value of artificial intelligence and also uses stereoscopic 3D to increase immersiveness.

The common conclusion seems to be that virtual communities may provide a more flexible and accessible learning experience, empower users (students, professionals, patients, etc) and enhance coordination of education/care services. Eysenbach et al. [10] on the other hand have argued that the advantages and disadvantages of using virtual communities for health and education still need to be studied. It should be noted that although very interesting and relatively successful in achieving their targets, none of the above mentioned approaches take advantage of all properties of digital media and provide an immersive virtual world with data collection features required for a quantitative analysis. Full audio/visual immersion and quantitative analysis are major missing parts in most of the existing approaches. Some other shortcomings are integration with web applications and real-time content update and web access from within the environment.

3. Carleton Virtual Framework

The cases studied and presented in this paper have been performed within the context of a web-based 3D virtual environment called Carleton Virtual (CV), designed for Carleton University (CU), Ottawa, Canada. Fig. 1 shows some views of our virtual environment, built using the web.alive technology (http://www.avayalive.com) by Avaya (http://www.avaya.com), which itself is based on web technologies and the Unreal Engine (http://www.unrealengine.com). As shown in this figure, CV provides spaces for lectures, various presentations, collaboration, social interaction and special activities. CV was designed to resemble the actual Carleton University campus. The design keeps some of the characteristic features and elements of the campus but allows modfications to improve the space usage and customize it for the virtual activities.

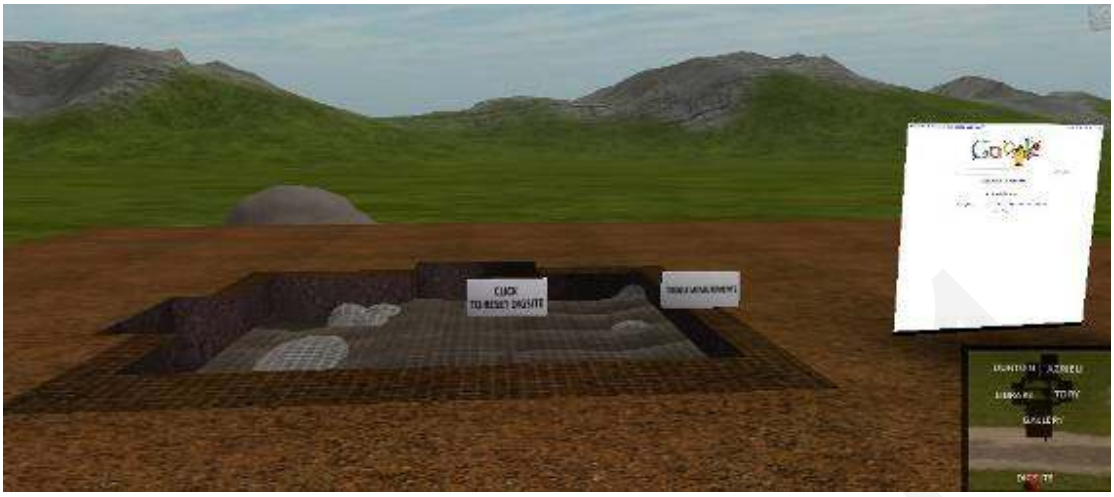

Fig. 1. Sample Views of Caleton Virtual

The content presentation is done through surfaces (screens) that can show videos, images, presentation files (supporting Powerpoint and PDF), and real-time web pages. This will allow instructors and other participants to easily access content and update it in real time while in the environment. The system allows 3D spatial audio. The sound level can be independent of distance (e.g. for speakers in the lecture hall) or change based on avatars distance (for local talks). At any time, users can know who can hear them, and also can control different audio features such as temporary mute. Different "areas" can be defined to simplify environmental control (e.g. private meetings) and behavioural monitoring (e.g. who goes where, etc).

General activities like lectures and collaboration involve tasks like presenting content in different forms, meetings, and social interaction. They are used in both case 1 and case 2. Special activities are those not commonly used by educators and students. The primary example is the excavation site discussed in case 2.

The implementation of this solution is broken down into three parts: (1) content, (2) telemetrics, (3) integration and deployment. The content is a set of 3D assets generated using standard software tools and environmental controls such as events, triggers, scripts, and volumes, defined using web.alive editor (which also serves as the tool to put together all the assets). Web.alive is based on the Unreal Engine by Epic Games (http://www.unrealtechnology.com) and supports a variety of different asset types. An overview of the telemetric instrumentation and data collection methodology is provided in the next sub-section to give insight into current and future potential of the system. Integration and deployment is done through web.alive server side tools in a web-based format.

In selecting the web.alive tool, the project gained access to a sophisticated and verbose logging system as well as a preconfigured set of analytic data and tools. In addition, the raw data affords the future potential of immersive learning focused analytics to help increase the overall effectiveness of education both within virtual environments and in real classrooms. Data is collected by the system on both the server as well as the client. For privacy reasons, the data collected on the server is limited to data which typically collected over the World Wide Web today such as source Internet Protocol (IP) address, user supplied name and action performed. On the client side, detailed logs are collected about encounters that occur within the environment – from individuals walking within

listening radius of each other (an encounter) to two or more individuals speaking to each other within listening radius at the same time (a conversation).

4. Archaeology Case

4.1. Background

The prototype immersive archaeological experience is built on the results of a 2003 excavation conducted by Shawn Graham (Carleton University) and Andrea Bradley (Institute for Field Archaeologists, UK) in Shawville, Quebec (Bibliographie de l'inventaire des sites archéologiques du Québec MCCQ 3453, rapport inédit). That excavation was conducted in the context of a community revitalization project, and was designed to introduce high school students to their community's heritage as a summer field school in archaeology. The excavation was directed with the intention of discovering the functional layout and extent of this brickyard on the property slated for development. We took the results of that excavation, and simulated one of the 2m x 2m trenches in the Carleton Virtual environment, creating soil layers, features, and artefacts in their relative correct positionings.

4.2. Task

In our initial assessment of the excavation, we wanted to explore whether or not the system made sense intuitively: if, in interacting with it, some appreciation of how archaeological knowledge is created was developed. A second aim was to understand how engaging it was, and what worked, or did not work, for the students in this regard. None of the student volunteers had any archaeological experience, aside from one introductory lecture on archaeological landscapes. The students were divided into two groups. One group was introduced immediately to the 3D simulation; the other group interacted with a 2D simulation developed by the Friends of Bonnechere Parks. The 2D simulation was selected for comparison as it is a well-developed example of archaeological outreach and a teaching tool expressly meant to address the same issues as our own prototype.

Both groups of students were given graphing paper and recording sheets, and instructed to talk aloud as they sought to understand what the site they were looking at represented. Afterwards, they were asked to complete a questionnaire, in order to enable cross-project comparability. These questions were assessed on a 5 point Likert scale, where the respondents indicated their degree of agreement with various statements:

4.3. Results

These results can be considered no more than anecdotal, of course. However by focusing our design on engagement, we seem to be reaching our initial group of use-testers at the level that we desired. The design of the simulation, and the affordances of immersive virtual experience, seem to be promoting the kind of emergent learning about archaeology that we should wish to promote to a wider public. When things broke in the excavation, or the students pursued a blind alley, they could hit the 'reset' switch, and start again. It was safe to fail, and thus promoted exploratory and constructivist learning. Both kinds of simulation had their strengths and weaknesses (see tables), but the 3D simulation seemed to elicit stronger agreement from our use testers when asked if it helped develop understanding; it also seemed to be a better environment for fostering group learning.

Table 1. Average Students Rating for 2D and 3D Archaeological Simulation

Questions were answered by rating from 0 (strongly disagree) to 4 (strongly agree)	3D	2D

1. I feel that I have learnt something by using this system.	3	1
2. The excavation simulation reveals believable information.	3.6	2.8
3. I found it difficult to find out information about the archaeological site.	1.4	2.6
4. The quality of the material presented was consistent.	3	1.8
5. I feel that using this system helps develop my understanding of fieldwork methods and techniques.	2.8	1.2
6. I found the system educationally stimulating.	3.4	0.8
7. I was easily able to identify material culture.	3	1.4
8. Tools provided allowed me to practice the theory relating to how archaeology creates knowledge.	2.4	1.8
9. Working in a group helped me understand the excavation process.	3.8	0.8
10. I found it useful to be able to identify where finds were located within the site.	2.8	1.8
11. The descriptions of the artefacts I found were reasonable.	3.2	1.4
12. I was able to find the tools and information I needed to maintain my context sheets.	1.6	1.8
13. I would have preferred to work individually using the system.	0.8	1.2
Average	**2.7**	**1.6**

5. Language Case

5.1. Background

This project was designed to give students in an Academic ESL class a unique opportunity to practice speaking and collaborating with their classmates using a common linguistic reference (English) in a risk-free environment. The 3D Carleton Virtual environment allowed students to collaborate in a space that was mutually convenient to the participants in terms of time and accessibility. This immersive learning opportunity made use of the existing Carleton Virtual (CV) framework. In particular, students collaborated in designated library rooms and final presentations were held in the Azrieli Pavillion.

5.2. Task

This project was piloted with an advanced English as a Second Language Academic (ESLA) class. To begin, students were introduced to the concept of virtual worlds and virtual environments through several assigned readings. This content helped them to understand basic issues and challenges associated with learning virtually or online. Additionally, these readings established some core academic and topic related vocabulary such as “virtual” and “immersive”. Students later attended a “virtual workshop” wherein they experienced firsthand the CV environment. Next, students were asked to choose between a *more traditional* group project and presentation or a *virtual* group project and presentation. Student groups then chose to compare two non-governmental organizations or two virtual learning platforms (these sub-topics related to broader course themes). Students in the *traditional groups* had to arrange to meet and plan on campus and the final oral presentation took place during a regularly scheduled class. Conversely, students in

the *virtual groups* committed to meet, collaborate and present exclusively in Carleton Virtual. All presentations included a reflective component and were evaluated.

Success of a virtual learning task depends on the task itself and the tools available within the immersive environment. As CV physically replicates a university classroom space, tools are not all that dissimilar to those tools students would normally use to work on traditional academic projects. But, what makes this experience unique is that the students can perform under the persona of their avatar anywhere and anytime.

The option to personalize one's avatar was also appealing to many students as they could alter such traits as hair, skin and eye colour. This simple act of fictitiously representing oneself (through a personalized avatar) generated spontaneous language production and even humour as group members commented on each others' changing appearance from day to day. Students liked the "game-like" scenario.

5.3. Results

The most positive outcome was seeing how student groups embraced this opportunity with new-found enthusiasm and energy (this project was introduced towards the end of term and so motivation was beginning to wane); this enthusiasm resulted in professional and well executed group oral presentations. Content was strong and delivery was well rehearsed as evidence in their formal stage presence, authentic and "true-to-life" avatar mannerisms, and well-timed delivery. In addition to increased motivation and task engagement, some learners in the virtual groups appeared less reticent presenting to other non-native speakers and actually demonstrated more initiative and problem solving skills than had been observed during group work in the traditional classroom. The 3D environment afforded students freedom and flexibility which motivated them to work more collaboratively in a "fun", risk free environment and consequently perhaps speakers were more comfortable speaking than in a traditional language classroom.

While student feedback was generally positive, there were some challenges. Overall learners liked that CV was more active and technologically attractive, and that communication was more similar to face to face communication compared to in other learning platforms. Challenges included technology and internet access, which were not always compatible or working.

It is important to note that this task was executed and piloted during a short period of time and at the end of term. Preliminary observations suggest that ESLA learners can benefit from immersive environments like CV, because they are fun, autonomous and relevant providing the task is challenging and generates opportunities for language production.

6. Conclusion

In this paper we have presented the results of two case studies on the use of 3D Virtual Environments as virtual learning spaces. The paper demonstrates how a 3DVE can be used as a learning tool by providing a virtual space that (1) allows people in different locations to interact, (2) gives users access to facilities not available physically, (3) enables activities that are not possible in physical settings, and (4) offers a variety of observation and measurement tools for performance evaluation and improvement. Each one of our two cases show a subset of these features. While the ESL course relies on interaction of people in different location and presentation of content virtually, the archaeology course is a good example of offering activities otherwise not available.

Further research is required to make better use of telemetric and analysis tools, and measurement data, in order to enhance the learning experience. Other types of educational activities such as science lab and also interaction with artificial intelligence-controlled characters are also among future objectives of our research.

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WAYS OF COMBINING TESTS AND TASKS FOR THEIR SOLUTION FOR UNIVERSITY INFORMATICS STUDY COURSES

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ABSTRACT

In higher school informatics study courses it is important to check students' knowledge, skills and competences. To check them the authors offer tests with the attached files, by means of which one can check students' abilities to make a decision, or to solve the tasks common in study work and professional practice. The article justifies the need for such tests based on author's studies made. In the academic work it is important to make decisions which computer programs and software tools to use. Moreover, it is good if a student can make such a decision as quickly as possible. In the tasks are mainly used the data on health care research, which have been generated by a random number generator, based on statistical results of scientific publications.

INTRODUCTION

The aim of the university informatics study course is to help students acquire the necessary knowledge and skills to be used for studies and labour market. It is recommended by several documents – ECDL (ECDL, 2011), profession standards (RPS, 2011), university study guides and course descriptions (LOUISCR, 2011; RSU, 2011; RTU, 2011), requirements for the organization of university study work (HSEC, 2011; LU, 2011), etc. The authors have identified also students' and practising specialists' examples from research work. In informatics study courses it is important to assess students' knowledge, skills and competences objectively. The authors have dealt mainly with individual tasks and tests to be done during a semester. Each type of testing has its advantages and disadvantages. According to the authors' opinion, the advantage of individual tasks lies in its ability to check just that knowledge, skills and competences which are needed in the study work. However, results of independent work only partially depict students' knowledge, skills and competences, since a student is offered much time for decision taking. Correction of the work takes much time per student. In higher schools, as a rule, there is a great number of students, therefore the problem is topical how to ease the routine work of the teaching staff. Nowadays a widespread method for knowledge testing is the computerized test (PTC, 2011; Prokofyeva, 2007; Yevsyukova, 2009). If tests are made and used not considering contemporary advances in this field, they may turn into a dangerous tool, which gives way in producing a large scale illiteracy (Yevsyukova, 2009). Authors fully agree to this statement and are of the opinion that tests have to be worked out skillfully. In promotion thesis (Prokofyeva, 2007) suggestions are given for the grounded choice of testing methods and models. By authors' opinion these suggestions are often quite useful, however, sometimes they cannot be generalized. The main thing is to know clearly what exact knowledge, skills and competences have to be checked. For instance, authors want to check students' skills to make a decision, what methods to use in data or information processing and then to solve task.
There are arguments „for" and „against" in the use of tests (Yevsyukova, 2009). For example, argument „against":

- tests lower the teachers' role.
- tests do not allow to consider students' knowledge and its depth from every point of view;
- tests create ungrounded differentiation of students.

Arguments „for":

- tests are means of radical transformation of the study process and making it more technological.
- test lower the teaching process to be time-consuming.
- tests allow to evaluate students knowledge more objectively.

The tasks with variants of answers lower the value of tests and do not allow to provide the necessary level for testing one's knowledge in its depth. The use of different type tasks (e.g., tasks with freely formulated answers, tests to determine the adequacy, tasks to determine the right sequence (Yevsyukova, 2009) gives a possibility to considerably diversify the tests and provide such a level which allows to check the knowledge of students to a full extent.
Authors consider that both the tasks with variants of answers, as well as those done by help of ICT, have their advantages. Tasks with variants of answers make it easier to summarize and assess the results, while

the tasks to be solved provide the level of testing the depth of knowledge. This is the reason, why the authors propose to join the possibilities of tests and tasks/exercises, by attaching the work-file to the test. It may include the generated data, unformatted texts, etc.
In study work it is important to make decisions, which computer programs, tools or methods to use and then to solve the tasks. It is also important that there would be a great number of tasks and each student would be given a chance to solve a different task as to its content. There exist programs for teachers how to design tests (LIIST, 2011; MDS, 2011; TMP, 2011), in which they can adjust the questions with answer variants for any theme. But, in order to develop at least 50 questions with answer variants, one has to contribute a lot of work. Authors have found out in informatics study courses that the test questions with answer variants can be generated by means of an algorithm, developing a great number of questions in a short time. In the same way one can work out an algorithm and corresponding computer programs for student testing, where, from a great number of questions they are selected according to groups randomly. In the tasks there are used mainly generated health care study data. For health care students it is easier to learn ICT using generated data, since then the tasks are closer to the study program and labour market needs.

TASKS ON BOOLEAN OPERATORS

In the study process there is usually a need for the information search. In the search it is important to use appropriate key words and Boolean operators. To acquire the information search one can look for themes in profession standards (RPS, 2011), university study guides and course descriptions (LOUISCR, 2011; RSU, 2011; RTU, 2011). Some names of themes contain one word, some 2, 3 and also several words. The more words, the greater are the possibilities in work with Boolean operators.
Two key words X and Y are given, which have to be linked to Boolean operators, e.g., in the study subject „Psychosomatic medicine" the words *Stress* and *Theory*. In the process of the information search the following 4 basic activities are possible with these words.

1. „X Y " – finding of exact phrase.
2. X Y or X AND Y – finding the information, which contains both key words.
3. X OR Y – finding the information, which contains one or the other key word.
4. X NOT Y – finding the information, which contains the first key word, but does not contain the second.
5. Y NOT X – finding the information, which contains the second key word, but does not contain the first one.

Thus, from 2 key words, which are taken from profession standards, university study guides or course descriptions, one can make a 5-test task with 6 answer variants, offering all expressions as solutions (because for finding the information, which contains both key words, there are available 2 solutions), which can be mixed up in different sequence P_6=720 variants.
If there are 3 key words X, Y, Z, then it is possible to change the combinations of the mentioned activities. All the before-mentioned 5 activities can be looked upon as two for the following word pairs. X and Y – 5 options. For each activity one can combine a different activity in 5 variants – consequently, 5x5=25 options. In a similar way, looking at X and Z, Y and Z, all in all we get 75 possible tasks. The number of possible variants of answers, offering all expressions as solutions, we get 6x6x3=108. By performing the test it is impossible to look through all 108 variants of answers. According to the authors' opinion it is sufficient to select 5 variants, offering still one extra answer as the last one „Neither of variants".

TASKS FOR DATA SELECTION

On writing a study paper, especially Bachelor's or Master's papers, usually data tabels have to be used. From authors' experience, one has to work more often not with the whole selection, but with the data selected on certain conditions. According to the authors' studies, students usually do not have difficulties to select the data on simple conditions. Greater attention should be paid to complex conditions, in which Boolean operators are used. The ideas here are similar to those in the information search, however, some nuances differ.
Here are possibilities to create a lot of tasks. But, from authors' experience, the most important are with Boolean operators AND and OR and including or not including the interval end-points. For the data selection one can use several computer programs and tools, e.g., MS Excel autofilter or detailed filter, SPSS. The notion of an interval here is relative. Quite often it is important to consider whole numbers or

numbers with a certain number of decimal symbols. To solve such tasks with various kind of tools, a student must know how to write the intervals with elementary conditions, which contain the symbols <, >, ≤, ≥, combining them with Boolean operators AND and OR. Here, for example, are available the following variants of answers.

1. In value interval [a;b] – x≥a AND x≤b.
2. In value interval (a;b] – x>a AND x≤b.
3. In value interval [a;b) – x≥a AND x<b..
4. In value interval [a;b] – x>a AND x<b.
5. Values, cutting out interval [a;b] – x<a OR x>b.
6. Values, cutting out interval [a;b] - x≤a OR x>b.
7. Values, cutting out interval [a;b] - x<a OR x≥b.
8. Values, cutting out interval [a;b] - x≤a OR x≥b.

Thus, looking at the task types, we can make for one data variable 8 exercises with 8 variants of answers, offering the expressions as solutions. The number of tasks can be expanded, taking various a and b values.

Data selection can be determined by very many variables, but according to the authors' experience, it is very rare when more than two are necessary. Let us visualize a situation if the data have to be selected by 2 variables. In one data table with n variables 2 may choose $C_n^2=n(n-1)$ in 2 ways. Here one can combine each of 8 variants with each, but let us look at the variant when for both variables these are simple conditions. Let us label one variable by x and the second by y. By combining symbols =, ≠, <, >, ≤, ≥ and watching MS Excel autofilter, we get, for example, are available the following variants of answers.

1. x=a and y=b – in one variable from the down-falling list a and in the second variable from the down-falling list b.
2. x=a and y≠b – in one variable from the down-falling list a and in the second variable Custom, does not equal b.
3. x=a and y<b – in one variable from the down-falling list a and in the second variable Custom, less than b.
4. x=a and y>b – in one variable from the down-falling list a and in the second variable Custom, greater than b. ...

Continuing in a similar way – combining 6 symbols by 2 in a way that the symbol sequence is not important, one can get from two variables $C_6^2=15$ tasks with 15 variants of answers, offering the expressions as solutions.

DATA ANALYSIS

Writing study papers, especially Bachelor's or Master's papers, it is necessary to perform data analysis. Authors offer to classify the most important tasks in these papers according to the number of variables under survey. The main point is – a student must be able to make a decision what statistic indicators to calculate, to design graphs and to apply hypotheses testing methods. From authors' experience, most important is to consider one, two or three data variables, if more – much rarer.

For the data analysis of one column, the authors propose such a test task: which statistical parameters, graphics, hypothesis testing, research methods can be used for the respective column. Here, for example, are available the following variants of answers.

1. Average
2. Minimum
3. Maximum
4. Mode
5. Median
6. Quartile
7. Percentile
8. Range
9. Interquartile range
10. Variance
11. Std. Deviation
12. Skewness
13. Kurtosis
14. S.E. Mean
15. Frequency

16. Percent
17. Valid Percent
18. Cumulative Percentile
19. Histogram
20. Bar
21. Pie
22. Confidence Interval
23. Chi square test
24. One sample t - test

The number of tasks made depends on the number of variables in the data table. From the given ones it is sufficient to select 5 variants, offering still an extra one as the last one „Neither of variants". In order to answer to such type of questions, a student must know the scale of measurements (Nominal, Ordinal, Scale), what statistic indices and methods are allowed to be used for each scale of measurements.

For data analysis of two variables the authors recommend such a test task. Label one variable by x, the second by y. Various scales are possible (Nominal, Ordinal, Scale). What statistics by groups can one calculate, what graphics, hypothesis testing, research methods can be used for the respective columns? Here, for example, are available the following variants of answers.

1. x descriptive statistics, data split by y.
2. x – dependent variable, y – independent variable; independent samples t – test.
3. x – dependent variable, y – independent variable; paired samples t – test.
4. x – dependent variable, y – independent variable; one – way ANOVA.
5. x – dependent variable, y – independent variable; linear regression.
6. x – dependent variable, y – independent variable; logarithmic regression.
7. x – dependent variable, y – independent variable; quadratic regression.
8. x – dependent variable, y – independent variable; cubic regression.
9. x – dependent variable, y – independent variable; power regression.
10. x – dependent variable, y – independent variable; exponential regression.
11. x – dependent variable, y – independent variable; mean plot.
12. x – dependent variable, y – independent variable; scatter plot.
13. Bar group chart.
14. Spearman correlation.
15. Pearson correlation.
16. Chi – square test.

For the first 12 methods there can be acquired twice as many variants of answers, changing the places of x by y. In such a way the task content will change. For instance, for the stature, grouping by eye color, it is useful to calculate the descriptive statistics, but the eye color for the stature is not useful.

Then there will be acquired 27 variants of answers, from which one can select 5.

For data analysis of three variables the authors recommend such a test task.. Label one variable by x, the second by y, the third by z. Various scales are possible for variables (Nominal, Ordinal, Scale). What hypotheses testing methods can be used in respective variables?

1. Spearman correlation.
2. Pearson correlation.
3. x – dependent variable, y, z – independent variables multiple linear regression.
4. y – dependent variable, x, z – independent variables multiple linear regression.
5. z – dependent variable, x, y – independent variables multiple linear regression.

In one data table with n variables 2 can choose $C_n^3 = n(n-1)(n-2)$ in 6 ways. Analogue test tasks can be made also for more than three variables.

CONCLUSIONS

1. By means of authors' recommended algorithms one can make many test tasks even for a small number of key words and data variables.
2. It is possible to make many more different tasks by key words and tables. The authors summarized the most important standard tasks on the grounds of their studies and experience.

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TITLE: WEB 2.0 TOOLS PROMOTING READING SKILLS AMONG UNIVERSITY STUDENTS

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ABSTRACT

This presentation investigates the use of Web 2.0 tools, including online voice recording technologies, online mind mapping and word cloud generators, to promote and monitor student reading for their academic studies in a course at an English medium university in Hong Kong. While it is straightforward to require students to read more, this creates a problem of how to monitor whether students are actually reading. In this pilot project, a variety of web 2.0 tools were used by students to share and record their reading as well as assist their vocabulary development, a welcome byproduct of reading more. The online component of the course used a course management system (moodle) with the blog on that system being utilised as a 'reading record'. The presentation aims to show how the project was implemented, as well as giving suggestions as to how it could be improved in the future.

WHAT ARE THE IMPLICATIONS OF FACEBOOK ON STUDENTS WHO ARE ENROLLED AT THE EASTERN MEDITERRANEAN UNIVERSITY?

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ABSTRACT

The aim of this research is to demonstrate the implications of "Facebook" on Eastern Mediterranean University students. The number of Facebook users has increased rapidly in recent years with reports of 500 million active users from different backgrounds. University students are the most active Facebook users. This study focuses on investigating implications of Facebook on university students. The researcher used a qualitative research method in this study. Instruments of data collection are observation, diary, and deep interview. The researcher interviewed 12 students (four Turkish Cypriots, four mainland Turks, and four foreigners). The interviews were conducted with undergraduate education students. The students were observed and asked to keep a daily diary about their Facebook experiences. Also, the researcher kept a daily diary about Facebook experiences as well with two students. According to students, Facebook provides good medium to make their lives easier in terms of their relationship. Nevertheless, Facebook also causes some problems in their relationships. Research findings also show that the students face difficulties related to time management when using Facebook. Students should be careful about time management while they are using Facebook. For further studies, researchers should continue to work on Facebook especially in terms of implications.

INTRODUCTION

Background of the Study

Facebook is social website that helps people to communicate with their friends and people collect information about each other. Mark Zuckerberg established this website in 2004. He studied at Harvard University. First of all, this website was established for students who are the students of Harvard University. After that, around the Boston's schools students have started to use Facebook and League of Ivy's schools' students have started to use it. All schools of USA's students have started to use. The students could only open account with school's e-mail addresses (edu, ac.uk, etc). Then, some high schools and companies joined in Facebook. All people can join Facebook with any e-mail addresses and age limitation. Facebook had 34.000.000 members since 2007. At the same time, Facebook became 7th website on worldwide because people visit it more than other websites. Besides, Turkish is more used language after English in Facebook. Facebook takes this name from "paper facebooks". Facebook has over 500.000.000 members. Site is always free for everyone. This website takes profit from (banner)' advertisements and groups of sponsorships. Users can publish their pictures, their interests, and publish daily news around worldwide. Moreover, they can send private message or can write on their friends' walls. Users of

Facebook can determine confidentiality of their profile. Authority of web chose Facebook as most successful Web 2.0 techniques. Some companies want to buy Facebook, nevertheless, Zuckerberg does not want to sell.

Web sites' properties

Photographs, Gifts, Bazaar Place, Pokes, Activities, Videos, and Foreign language option

Motivation of the Study

Facebook takes more attraction because before the wide spread of internetworking which led to the Internet, most communication networks were limited by their nature to merely let communication between the stations on the local network and the prevalent computer networking method was based on the central mainframe computer model. Facebook provides numbers of things to people whatever people want to do. Being user of Facebook becomes popular among several people who like to use internet and like to learn technology.

Aim and Objectives of the Study

The researcher wanted to search implications of Facebook on students' life who study at EMU because the researcher thought that Facebook affected people life in a bad way rather than good ways because of this reason, the researcher started to examine implications of Facebook on students' relationship who study at EMU.

Objectives of the study

- To learn why do students use Facebook
- To learn advantages and disadvantages of Facebook for students
- To learn impact of Facebook's games on students
- To learn Picture and Picture's comment importance for students
- To learn implication on students' normal life.

Significance of the Study

The aims of study were to show implications of Facebook on students' life. The researcher wished to learn students, who enrolled EMU, sustained which kind of implications and what are the results of implications on students. At the same time, the researcher desired to find positive angle of Facebook to learn why Facebook is more vital and indispensable. Facebook is an important medium in 21st century because numerous people use it and people affect from it in negative ways and positive ways, for this reason, doing investigation was essential about it.

Limitation of the Study

Limitation of study is that, the researcher determined to conduct research about implications of Facebook on only EMU students since the researcher was one of MA student of EMU. The study was done 2009-2010 education years. Numbers of students

were delimitation of study. For this reason, the researcher came across limited time problems. In this research, limited information was taken by the students. According to these reasons the research was affected and came across limited time opportunity to research and gathered information from sample of research.

METHODOLOGY

Aims of study were to indicate implications of Facebook on students' relationship who are enrolled EMU. The kind of research was qualitative. Qualitative research has grown out of diverse disciplines (anthropology, sociology, psychology etc.) that are marked by distinctive interest, theories, issues and research methods. In this research, Case study was preferred as research design. Population of this research was EMU's students.

Population and Sample

Sample of study was determined according to the researcher. The researcher chose sample in a convenience sampling. Gender identification was done. Also nationality differences were taken an account while choosing sample. Totally, 14 students were chosen for being subjects of this study. The researcher interviewed 12 students (four Turkish Cypriots, four mainland Turks, and four foreigners). The interviews were conducted with undergraduate education students. These students are used for interview. Two students are chosen for writing diary about Facebook with two female students. Also, the researcher writes diary. For providing confidentially, nicknames were given to students from one to fourteen.

Data collection procedure and Instrumentation.

Data collection procedure was qualitative. Data collections were done in EMU. First of all, the researcher talked with students who were chosen as sample and took their permission and took appointment for making interview.

For writing diary, the researcher took permission from two students to write daily diary, Also, these two students were observed by the researcher because they were in favorable environment to observe them. One of them was workmate of the researcher so that the researcher had chance to observe the student easy and one of them was friend so that come opportunities were available for the other student.

Data Analysis Procedures

For interview analyzes, first of all, all records were being written and which were being divided according to specific categories, namely, in thematic way. Also, for observation and diary, the researcher analyzed according to interviews' criteria in thematic way.

Ethical Issues in design, Data Collection, and Analysis

Researcher wanted to show implication of Facebook so that as can see previous section, specific students were chosen, all of them labeled by numbers from 1 to 14 . In respect of this research aim ethical issues in design data collection and data analysis

were done. Do not give any distribution, physical or psychological harm to anyone else during this research Each of them have one number, instead of using name, research used numbers for providing confidentiality . During this process, informed consents took important role that included verbal contract for all of participant in this research. Since, some situation would be happened and participant may want to give up study, contract that gives opportunities to be free for changing their decision about continue or give up study. Data collection boundaries of this research, all participants are voluntary, nevertheless, condition of making interview ,observation and writing diary of research affected participant while making interview, observation and writing diary.

ANALYIS AND FINDINGS

According to interview question's answers, observation and diary, Facebook has implication on students' life who study at Eastern Mediterranean.12 students were chosen for interview questions. Each students answered interview question one by one.

Spend time on Facebook: 1 of student claimed that s/he uses Facebook more than 5 hours. 1 of student claimed that s/he uses Facebook at least 1 hour.1 of student claimed that s/he uses Facebook 30 min in a week.2 of students claimed that they uses Facebook 4-5 hours daily.2 of students claimed that they uses Facebook 1 hours daily. 4 of students claimed that they use Facebook 3-4 hours daily.

Aims of using Facebook : Almost all claimed that they used to talk with their friends and their family. Only one of them mentioned that s/he used to play games and to talk with their friends and family.

Advantages of Facebook: Four of them claimed that Facebook provided cheap communication. Twelve of them claimed that Facebook provided to communicate easily with their friends, and their family's member. Two of them claimed that Facebook helped to spend their free time. Three of them claimed that Facebook helped to follow current events what happened in world. Four of them claimed that they could establish easily communication on Facebook. One of them claimed that Facebook provided opportunities to be social.

Disadvantages of Facebook: Five of them claimed that Facebook caused to spend more time. One of them claimed that Facebook caused to come across health problems. One of them claimed that Facebook caused to open to others and can be reachable for others. One of them claimed that Facebook caused to forget lesson and homework.

Games: Two of them claimed that games leaded to spend more time because of requirement of some games. Two of them claimed that games helped to find for talking topic with friends. One of them claimed that games provided to establish close relationship. One of them claimed that games did not provide any benefit/backward only provide to fill free time. One of them claimed that games did not lead to spend more time.

Chat-message: Eleven of them claimed that they used chat-message especially for reaching their friends to talk. One of them claimed that she/he did not use

chat/message, prefers to use other thing. Four of them claimed that they also talked with unknown people. One of them claimed that she/he used for talking opposite sex.

Picture: Eleven of them claimed that they generally thought positive things about Facebook. One of them claimed that she/he did not use their pictures. Eight of them claimed that they felt well after reading comment of their own pictures. Two of them claimed that they found unnecessary thing. One of them claimed that uploading picture was habit for him/her self

Video-Application: Three of them claimed that video-application helped to improve their relationship. Five of them claimed that video-application helped to learn certain things. One of them claimed that video-application helped to send message to someone. One of them claimed that video-application helped to reach other people and caused to learn what happen in the world. One of them claimed that video-application helped to get pleasure. One of student claimed that video-application was nice for him/her self. Two of them claimed that video-application was funny thing. One of student claimed that video-application helped to concentrate on their concerned area.

Being member of Facebook's group(s): One of them claimed that being member of group provided chance to find work. Six of them stated that being member of group provided suitable environment to gather information about certain things. Two of them noted that being member of group provided to share information with other members. Two of them claimed that being member of group provided to support their ideas. One of them claimed that being member of group provided to follow current things about their interests. One of them said that being member of group provided to meet new people.

The Impact of Facebook on normal life's relationships: Almost all claimed that Facebook affected their relationships in a bad way, they could not share time with their families. One of student claimed that Facebook leaded to be addicted and another one claim that Facebook reasoned to lose their friends.

Observation Analyze: Generally, students spent more time to talk with their Facebook's friends and to play popular Facebook's games such as Farmville.

Diary of the Researcher: The researcher mentioned what she did during the using Facebook. Generally, she used to spend free time, to take pleasure, to be aware of current activities, to play games, to chat with Facebook's friends. Facebook caused some backward to the researcher, for example, the researcher had health problems, became addicted and did not give enough importance on school stuff and came across some matters with her family about Facebook.

Diary of students: Students who were observed, one of them generally utilized Facebook to do similar things. For instance, the students was online during the two or three hours to checks own notifications and to find friends to contact. Also, the student preferred to use Facebook to play popular games.

In an each day, the second student, who was observed, spent more time to talk with his or her Facebook's friends, to play more games and to follow recent issue and

events on Facebook. Therefore, the second student claimed that "I have started to become addicted"

The results of interviews indicated that students can communicate with their friends, however, Facebook caused to spend more time and prevent to communicate with their families or others since students used their free times on Facebook instead of passing time with their families or other. As already mentioned, 12 students were chosen for interview. Almost all claimed that, Facebook took their time, the researcher agreed with students since and the researcher denoted on own diary as "I start to become addicted" like other subjects stated similar ideas. In addition to this, Facebook helped students to talk with their friends, to find their old friends, to meet new people and get pleasure from talking with others Approximately, large numbers of students stated that, playing games cause to spend more time and reasoned to be addicted of games. Because of some games leaded to become addicted according to the students. Also, according to interviews' records, Facebook helped to remember something, almost all students shared similar idea about getting information from application parts of Facebook and being members of some groups. Student 13 and student 14 wrote diary, student 13 stated, Facebook's games caused to be online specific time. And Student 1 and 2 shared similar idea about it. Moreover, student 14 claimed that need to be online all the time to discuss certain issue on Facebook. The researcher also made observation. During the observation, it was understood that people spent more time for Facebook. The results indicated that implications of Facebook can be seen since people's normal life affected from it, caused to health problem for people so that people cannot separate time for their offline relationship because of spending more time for Facebook.

According to the collected data, Facebook had important place on students` life. It affected their intimate relationships, their health, and their education life so on and so fourth. Since students spent more time on it and Facebook liked became part of their life and created second world for themselves. The researcher believes that people especially students who used Facebook, they can be addicted and isolated from normal life because of Facebook's facilities.

CONCLUSION

The researcher wanted to investigate Facebook's implications on students' life who study at Eastern Mediterranean University. The type of research was qualitative study and the approach of research was case study. First of all, the subject of research was determined, and information was collected to prepare interview questionnaire, then, literature reviews were done. After that, the researcher took permission to make interviews and interviews were done with 12 students . At the same time, observations were done, two students were observed and diaries were written about Facebook approximately during the one week what did the researcher and two students do on Facebook. The results of study show that, Facebook takes important place on students' life who study at EMU. Some of them gained benefit from it and unfortunately some of them affected badly. All objectives were found after the analysis of collected data. The researcher learned why did students use Facebook, the advantages and disadvantages of Facebook for students, the impact of Facebook's games on students,

the importance of Picture and Picture's comments for students and what are implications on students' normal life.

The purpose of study was that Facebook has implication on students' life who study at EMU. Because, nowadays, Facebook creates new dimensions on people lives especially on students who study university. Facebook causes to some problem for people. One of them was implications on students' relationships. Exactly, interviews' results demonstrate implications of Facebook, some statement of the students totally explained the aim of study. Shortly, Facebook has implication on students about a lot of things such as normal life's relationships. The researcher recommended that people should do time management well while using Facebook and avoid from being addicted of Facebook. People should try to take pleasure and benefit from Facebook. Also, people should not allow to Facebook affects them. For further studies, researcher can work with large numbers of students. Besides researcher can work with universities' staff to show that role of Facebook on their labour power and their routine activities. People should be aware of every danger since some innovation brings danger to people who use it.

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A compiled Pack of EDUC 308 Research Methods.

WHY TURKISH PRE-SERVICE TEACHERS PREFER TO SEE POWERPOINT PRESENTATIONS IN THEIR CLASSES

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ABSTRACT

PowerPoint has become very popular presentation software used in educational settings. The literature indicates that the effectiveness of PowerPoint presentations is inconclusive and that students have positive attitudes toward PowerPoint presentation. However, the question why students prefer to see PowerPoint in their classes is still in discussion. Therefore, the purposes of the study are to investigate pre-service teachers' attitudes toward PowerPoint presentations, understand the reasons why they prefer to see PowerPoint presentations in their future classes, and their suggestions about the ways to improve the quality and usefulness of PowerPoint presentations. "Presentation Software Survey: Student Perspective" (Frey & Birnbaum, 2002) was used in order to collect data for this study. The survey contains 12- item Likert type questions and two open-ended questions. The data were collected from 211 pre-service teachers studying at three different departments in one of the large Turkish Universities. The findings of the study indicated that the majority of the participants prefer to see PowerPoint presentations in their future classes for helping them study for the course exams and providing the long term retention of knowledge. More than half of the participants suggest more visuals, pictures, and videos should be used in PowerPoint presentations.

Introduction

PowerPoint has become very popular presentation software used in business and educational contexts (Craig & Amernic, 2006; Szabo & Hastings, 2000). It is estimated that PowerPoint is used over 30 million presentations a day and its software is on 250 million computers on the world (Savoy, Proctor, & Salvendy, 2009). While PowerPoint lectures become more prominent in the higher education institutions (Brown, 2007; Craig & Amernic, 2006; DenBeste, 2003; Gier & Kreiner, 2009), there has been a debate about the advantages, benefits, and effectiveness of the software. Initially PowerPoint is designed to help structure both the content and the process of a lesson or lecture and prevent it from rambling (Hlynka & Mason, 1998; Savoy et al., 2009). Supporters of PowerPoint believe that PowerPoint helps to keep student's interest and attention to the lecture (Szabo & Hastings, 2000), improves students' learning (Lowry, 1999), and aids explanations of complex illustrations (Apperson, Laws, & Scepansky, 2006). On the other hand, Creed (1997) describes PowerPoint as a teacher-centered instructional tool that nourishes teacher-controlled lectures. Similarly, Tufte (2003) points out that PowerPoint reduces the analytical quality of a presentation, limits the amount of detail that can be presented, and often weakens the verbal and spatial thinking.

Likewise, the research studies indicated conflicting findings about the effectiveness of the PowerPoint in terms of improving student learning (Craig & Amernic, 2006; Levasseur & Sawyer, 2006). Gier and Kreiner (2009)' s study conducted on 73 undergraduate psychology students showed that when the students were actively engaged in the class and PowerPoint presentation was supported by content based questions, the information retention was increased. Szabo and Hasting (2000) conducted three studies to investigate the efficacy of PowerPoint lecturing and found a significant difference of students' grades between overhead lecture and PowerPoint lecturing in only their second study. They suggested that the efficacy of PowerPoint lecturing may be case specific rather than universal.

Other studies found no significant difference in students' academic achievement between the traditional lectures and PowerPoint supported lectures (Daniels, 1999; Savoy, Proctor, & Salvendy, 2009). Daniels studied with a group of students taking economy courses without desktop presentation programs (DPP) materials and a year later studied again with the same group of students taking another economy course with DPP materials. Daniels compared students' test scores and feedbacks and concluded that use of DPP neither improved nor hindered student performance. However, almost all of the students (98%) had positive attitude toward DPP materials and found DPP materials useful. Similarly, Savoy et al. conducted a study in the U.S. with 62 students enrolled in the human factors in engineering course in order to compare information retention from PowerPoint and traditional lectures. The findings

of the study also showed that no significant difference was found between PP group and the traditional group in terms of most of the assessment variables. In fact, the traditional group scored higher than the PP group at audio assessment variable.

Apperson, Laws, & Scepansky (2006) examined the impact of the use of PowerPoint on students' experience in the classroom. The findings of the study indicated that although there were no differences in grades as a result of the use of PowerPoint, organization and clarity, entertainment and interest, professor likeability, and good professor behaviors were enhanced with PowerPoint.

Bartsch and Coben (2006) investigated the effects of three types of presentations including transparencies, basic PowerPoint (only text) and expanded PowerPoint (text with pictures and sounds) on student learning and attitudes. Students preferred PowerPoint presentations since they believe they learned more from PowerPoint presentations. However, their course grades revealed a different conclusion that students came from the expanded PowerPoint lectures did worse on the exams and had greater dislike for slides with pictures which were not relevant. Other researchers have demonstrated that material such as irrelevant sounds (Moreno & Mayer, 2000), interesting but extraneous text (Schraw, 1998), and irrelevant pictures (Mayer, 2001, p. 113) can reduce comprehension.

Although the research about the effectiveness of PowerPoint supported lectures is inconclusive, studies indicate that students have positive attitudes toward PowerPoint (Apperson, Laws, & Scepansky, 2008; Can, 2010; Craig & Amernic, 2006; Kahraman, Çevik, & Kodan, 2011; Levasseur & Sawyer, 2006; Susskind, 2005; Uz, Orhan, & Bilgiç, 2010). Apperson, Laws, and Scepansky (2008) investigated student preferences regarding the physical structure of PowerPoint. Students completed a 36- item 7-point Likert scale survey and four open-ended questions indicated that they preferred the use of key phrase outlines, pictures and graphs, slides to be built line by line, sounds from popular media, or that support the pictures of graphics on the slide, color backgrounds, and to have the lights dimmed.

Perry & Perry (1998) surveyed with 98 students from computer information system and teacher education departments in order to determine students' preferences among four different types of presentations including multimedia, overhead transparency, chalkboard, and straight lecture. They found that a majority of them preferred multimedia presentations for several reasons including being more eager to attend to class, finding the course more interesting and more enjoyable and holding their more attention. They also believed that they learned better and easily understand the difficult concepts with multimedia presentations. Can (2010) studied pre-service teachers' attitudes towards the effects of use of teaching materials including overhead projector and projector on learning and found that students believe that use of overhead projector and projector brings some kind of change, prevents teaching from being monotonous, and helps making a lively, colorful teaching and learning environment.

In a recent study, Kahraman, Çevik, and Kodan (2011) investigated the students' attitudes toward the use of PowerPoint in terms of gender and departments. They collected data by using "attitude toward the use of PowerPoint" instrument from 653 students studying at different colleges in the same university. The findings of the study indicated that there was no significant difference of students' attitudes toward the use of PowerPoint in terms of gender, but there was a significant difference in terms of colleges. Students enrolled in the Faculty of Engineering had more negative attitudes towards the use of PowerPoint compared to other students at different faculties (education, economics and administrative science, and vocational higher education). Some students believed that PowerPoint presentation increase the retention of information in the mind by featuring visuals and increases their motivation by arousing attention and interest whereas others believed that PowerPoint becomes less effective and more boring if they were used more frequently than necessary and especially the use of PowerPoint carelessly and sloppily prepared cause distraction. Students at school of engineering also expressed that they did not like the PowerPoint presentations filled predominantly with mathematical expressions.

In another study, Uz, Orhan and Bilgiç (2010) collected data via using a Likert type survey developed by researchers order to examine pre-service teachers' opinions of the PowerPoint presentations. Data were collected from 684 pre-service teachers studying at different departments of colleges of education from four universities in Turkey. Participants in this study expressed partially positive opinions of the designs of PowerPoint slides and the effects on their learning. Students studying at department of computer education and instructional technologies expressed less positive attitudes while students from the department of education religion and ethics had more positive opinions of the use of PowerPoint. According to the results of the study, students agreed that PowerPoint presentations make courses more interesting and easy to follow. However, the findings of the study only came from students' responses on a Likert type survey. Thus, students were not given an opportunity with an open-ended questionnaire to explain why they prefer or not prefer to see PowerPoint in their future classes. In summary, the recent studies indicated that students found PowerPoint lectures extremely helpful to take

notes for exams (Frey & Birnbaum, 2002), excellent method of presentation that aided their learning (Clark, 2008), and still preferred PowerPoint lectures even though it was not affected their grades in a positive way (Bartsch & Cobern, 2003).

Although studies showed that student have positive attitudes toward PowerPoint even when their achievement is not positively affected, most of them merely focused on comparisons of students' attitudes in terms of gender and department (Apperson, Laws, & Scepansky, 2008; Can, 2010; Craig & Amernic, 2006; Kahraman, Çevik, & Kodan, 2011; Levasseur & Sawyer, 2006; Perry & Perry, 1998; Susskind, 2005; Uz, Orhan, & Bilgiç, 2010). However, the reasons why they prefer to see or not to see PowerPoint presentations in their classes and what they suggest how to improve the effect of PowerPoint are still in question. Therefore the purposes of the study are to investigate student's attitudes toward PowerPoint presentations, understand why they prefer to see or not to see PowerPoint presentations in their classes, and their suggestions about how to improve the quality and usefulness of PowerPoint presentations. In order to investigate these issues, the following research questions were generated.

1) What are attitudes of the Turkish pre-service teachers toward PowerPoint?
2) Why do they prefer to see or not to see PowerPoint in their classes? In other words, what are the reasons behind the attitudes of the Turkish pre-service teachers toward PowerPoint?
3) What do Turkish pre-service teachers suggest to improve the quality and usefulness of PowerPoint?

Methodology

Data Collection

In order to collect data for this study "Presentation Software Survey: Student Perspective" (Frey & Birnbaum, 2002) was used. The survey includes 12- item Likert type questions and two open-ended questions. The survey was translated to Turkish by the author and it was translated back to English by another Turkish scholar in order to increase the reliability of the translations. Based on comparisons and revisions, the final Turkish version of the survey was created. After converting the negative statements, the reliability of the survey was calculated as Cronbach's alpha = 0.82, which indicates that it is a reliable survey. Data for this study were collected in fall 2010.

Participants

The data were collected from 211 pre-service teachers (116 female - 95 male) in one of the large Turkish Universities. The participants were junior and senior students studying at three different teacher education departments (66 elementary, 84 social studies, and 61 science education). All the participants were voluntarily participated in the study. The survey was given to the participants in different classes. The participants generally completed the survey in 15 -20 minutes.

Data Analysis

The quantitative part of the data was analyzed by using SPSS (18.0). Descriptive statistics was calculated for each question. The mean scores for responses given to the survey questions were calculated (strongly disagree= 1, strongly agree= 5). The qualitative part of the data was analyzed by using inductive analysis.

Results

In order to answer the first research question, descriptive statistics was calculated. Table 1 shows the mean and the percentages of the responses given by participants to each statement. As seen in Table 1, the majority of the participants (89%) have positive attitudes toward PowerPoint presentations (Question 1, M= 4.01, out of 5). An analysis of the responses given for each statement also indicated that pre-service teachers have positive attitudes towards PowerPoint presentations. The qualitative data from the second part of the survey also confirmed this finding. The data analysis showed that vast majority of the participants (191 participants = 90.5 % of the total) would like see more PowerPoint presentations in their future classes.

In order to answer the second research question, both qualitative and quantitative parts of the survey were analyzed. Data analysis suggested that there are several reasons why pre-service teachers prefer to see PowerPoint presentations. One of the most significant findings of the study indicated that

students prefer PowerPoint presentations because a majority of them (89%) believed that they helped to study for course exams (M= 4.21, out of 5). More importantly, almost half of the participants (47%) strongly agreed with this view. Therefore, it was the most prevalent reason why pre-service teachers prefer to see PowerPoint presentations in their future classes. This popular reason may come from students' beliefs that it is enough to study handouts for preparing for exams.

The second widespread reason why pre-service teachers prefer to see PowerPoint presentations was their beliefs that PowerPoint presentations hold their attention (M=4.09). A majority of the participants (89%) agreed with that PowerPoint presentations hold their attention during the class. Another reason for pre-service teachers' preferences was the role of visual images presented in PowerPoint presentations on the retention of the content for exams. A majority of the participants (88%) believed that visual images presented in PowerPoint presentations help them to recall content during exams (M=4.01). Similarly, 77% of the students indicated that they do not prefer bullet-point, text-only PowerPoint presentations over presentations with audio, video, or graphics. Many students (84%) also believed that PowerPoint presentations help to emphasize key points during lectures (M=3.92) while 77% of the participants believed that professors who use PowerPoint presentations are more organized during their presentations.

	Strongly Disagree SD (%)	Disagree D (%)	Neutral N (%)	Agree A (%)	Strongly Agree SA (%)	Mean
1) PowerPoint presentations hold my attention.	2	7	2	**57**	32	4.09
2) PowerPoint presentations increase the likelihood of inappropriate classroom behavior.	13	**53**	17	16	2	2.42
3) I prefer traditional lectures using a blackboard or whiteboard to PowerPoint presentations.	25	**45**	5	14	11	2.41
4) Power Point handouts help me to take better notes during classroom lectures.	6	11	9	**54**	21	3.73
5) Handouts printed from PowerPoint presentations help me to study for course exams.	5	4	2	42	**47**	4.22
6) Professors who use PowerPoint presentations are more organized during their presentations.	4	6	10	**57**	24	3.91
7) I prefer bullet-point, text-only PowerPoint presentations over presentations with audio, video, or graphics.	29	**48**	5	9	9	2.21
8) Visual images presented in PowerPoint presentation lectures help me to recall content during exams.	5	5	2	**59**	29	4.01
9) I am less motivated to attend class when PowerPoint presentations are used during the lecture.	21	**53**	9	11	6	2.28
10) PowerPoint presentations help to emphasize key points during lectures.	3	6	7	**62**	22	3.92
11) I have a positive attitude towards PowerPoint presentations.	4	4	3	**64**	25	4.01
12) I am less likely to attend class when the professor posts PowerPoint handouts to the Web.	18	**39**	25	14	4	2.48

Table 1: Percentages of the responses given by participants for each statement.

Students' responses to the question why they prefer to see PowerPoint presentations were listed in Table 2. As seen in Table 2, a majority of the participants prefer to see PowerPoint presentations for several reasons. The most widespread response was the retention. Many pre-service teachers believed that PowerPoint presentations provide long-term retention of information and help them to understand the content. Here are the some examples of students' responses.

"I would like to see it more because PowerPoint presentations show the main concepts and help them stay in mind for longer period" (P#6).

"Yes I would like to see more because I believe they increase the retention of knowledge in mind" (P#46).

Taking notes more easily with PowerPoint was the second common response given by the participants. Many participants indicated that they prefer to see PowerPoint presentations since they provide a summary of the topics and highlight important points. Increasing their motivation, getting their attention were other popular responses provided by the participants. Participants also believed that PowerPoint presentations should be used since it is easier to prepare for exams with handouts. For example, participant #5 stated that "I think I am getting better prepared with both my notes and PowerPoint

handouts". There have been few students stated that they prefer to see PowerPoint if they are carefully prepared and properly used. For example, participant #7 stated that "sometimes I want to see; sometimes I do not because the most difficult topics can be passed quickly by pushing the buttons".

Although the majority of the participants stated that they prefer to see PowerPoint presentations in their future classes, few students (7% of the participants) indicated that they did not want to see PowerPoint presentations for several reasons. One of the reasons indicated by participants who did not want to see PowerPoint presentations was that PowerPoint presentations were not appropriate for every topic. For example, participants #18 stated that "I would like to see in social science (sözel derslerde) courses but not to see in science and maths courses (sayısal derslerde)". Other reasons given by the participants may listed as passing the slides too quickly, not being in detailed, using too much, not preparing properly, not being explanatory, not allowing discussion much, and distracting.

Students' responses to open-ended questions confirmed the findings of the survey. Very few students stated that they did not prefer to see PowerPoint presentations for some reasons such as sliding too quickly, being not appropriate for every topic, being not necessary always, using too much, distracting their attention. The participant #179 stated that "do not want to see because the presenter may not explain topics in detail and may be limited, it is unnecessary to see the same thing you heard". Six of the participants left unanswered to this question.

Students' responses	Frequency
Prefer to see because;	
Retention	53
Taking notes	39
Help to understand topics	38
Motivation	35
Getting attention	34
Visual effects/learning	31
Highlighting important points, summary	25
Entertainment	19
Planning well	17
Preparing for exams	12
Easy to follow	10
Time saving	7
Others (easy to prepare, concrete, active, achievement etc.)	5
Prefer to see with conditional	
If prepared to summarize topics	2
If prepared depending on needs	1
If use properly	1
If included interpretation	1
If it is explanatory	1
Not prefer to see because;	
Not necessary for some topics	4
Sliding too quickly	1
Not in detail	1
Too much used	1
Distracting	1
Not allowing discussion much	
No response	6

Table 2: Students' reasons why they prefer to see (or not to see) PowerPoint presentations.

In order to answer the third research question, open-ended questions in the second part of the survey were analyzed. Table 3 shows participants' suggestions of the ways to improve the effectiveness and the quality of PowerPoint presentations. One of the most prevalent suggestions indicated by more than half of participants (128 participants = 61 % of the total) was that more visuals including pictures, photos, videos should be placed in PowerPoint presentations to improve the quality and usefulness of PowerPoint presentations. For example, the participant #137 indicated that "more visuals, pictures, or videos should be used if there is only text, it can be boring". Another participant (#5) stated that "in order to become more useful, PP presentations should be supported by visual effects especially videos related to the content that helps us comprehend and increase our motivation". A number of the participants suggested that handouts should be given before the class so that students can follow during the lectures and take additional notes on it. For instance, the participant #88 stated that "If the handouts given beforehand, we will be able to add any explanation made by teachers on our handouts". Some other

participants indicated that they want to have handouts for preparing exams. Here are some examples of these responses.

"Handouts should be given in order to increase achievement on exams" (P#85).

"I believe that providing handouts helps not only learning but making study easier for exams" (P#75).

Suggestions	Frequency
Adding more visuals, pictures, videos, sound	128
Providing important points/key words Less information	36
Providing handouts beforehand	17
Not reading directly	9
Using appropriate font size	8
Not using always	7
Not being too long	7
Not passing slides quickly	7
Using appropriate colors	6
Connection to daily life	6
Being interesting	6
Providing student participation	4
Preventing technical problems	3
Balancing texts and images	3
Being fun	2
Others (darkness, music, prepared by students etc)	3
No response/idea	20

Table 3: Pre-service teachers' suggestions of the ways to improve the effectiveness of PowerPoint presentations

Making presentations interesting and fun was other suggestions made by some participants. Participants indicated that they did not want the instructor read the text directly without interpreting or giving examples from daily life. Some of the participants suggested that the instructor should provide enough time before going to the next slides, should not use PowerPoint presentations too much, and should provide student participation by either asking questions or having them participate in activities. Other suggestions were related to physical structures of PowerPoint presentations such as picking up appropriate colors, font size and text type for effective presentations. Twenty of the participants did not provide any suggestions for improving the quality of PowerPoint presentations.

Discussion

The findings of the current study provide valuable insights about why pre-service teachers prefer to see PowerPoint presentations in their future classes and what they suggest in order to improve the quality and effectiveness of the PowerPoint presentations. The results of the current study indicated that pre-service teachers have a positive attitude toward PowerPoint presentations and would like to see more in their future classes. This finding is consistent with the findings of other studies (Apperson, Laws, & Scepansky, 2008; Can, 2010; Craig & Amernic, 2006; Kahraman, Çevik, & Kodan, 2011; Levasseur & Sawyer, 2006; Perry & Perry, 1998; Susskind, 2005; Uz, Orhan, & Bilgiç, 2010).

Among many reasons why pre-service teachers prefer to see more PowerPoint presentations, the most significant and common one was pre-service teachers' beliefs that it is easier to prepare with PowerPoint handouts for exams. Students may think that it is enough to study PowerPoint presentations handouts for preparing on exams. This finding is also consistent with Frey & Birnbaum's (2002) study showed that students think PowerPoint presentations help them to study for the course exams. However, this situation may be considered as a disadvantage of PowerPoint presentations if students think that it is enough to study only handouts from Powerpoint presentations for the course exams. In the literature this disadvantage was discussed by Gier and Kreiner (2009) stated that students might falsely believe that if they study only what is on the PowerPoint slides that they will do well on the exams. This could be a reason why many studies did not find the significant effect of PowerPoint presentations on student learning (Apperson, Laws, & Scepansky, 2006; Bartsch & Cobern, 2003; Daniels, 1999; Savoy, Proctor, & Salvendy, 2009).

Another important finding of the current study was the common belief that PowerPoint presentations hold their attention. This point was consistent with Szabo & Hastings's (2000) study. However, the current study indicated that Turkish Pre-service teachers are more likely to have this belief than their counterpart in Frey & Birnbaum's study (2002). According to the current study, Turkish pre-service teachers are more likely to think that visual images presented in PowerPoint presentations help

them to recall content during the exams than their counterpart in Frey & Birnbaum's study (2002). This could be the reason why a majority of the participants in the current study suggested that they would like to see more visuals, pictures, diagrams, videos in PowerPoint presentations. In the current study, Turkish pre-service teachers seemed to be in favor of more visuals than texts, confirmed by Açıkalın's (2009) study indicated that Turkish pre-service teachers focus on more visuals on their Internet search.

The present study indicated that Turkish pre-service teachers would like to have handouts from PowerPoint presentations beforehand. However, the reason for this suggestion was not due to the lack of attendance as indicated by Frey & Birnbaum's (2002) study. Turkish pre-service teachers in the present study did not indicate that they were less likely to attend class when PowerPoint presentations used and handouts from PowerPoint presentation given by hand or posted on the web. In the current study, some suggestions made by Turkish pre-service teachers were discussed in the literature (Kahraman, Çevik, and Kodan, 2011) that PowerPoint presentations should be prepared carefully and used properly.

Conclusion

PowerPoint presentations are widely used in education and discussed in the literature. The literature indicates that pre-service teachers have positive attitudes toward PowerPoint presentations although the effectiveness of PowerPoint presentations is inconclusive. This situation brings an important question how to improve the quality of PowerPoint presentations in order to increase student learning. In terms of this aspect, the present study may have valuable contribution to the literature. Here are some suggestions based on the findings of the current study.

1. The quality of PowerPoint presentations depend on mainly the instructor. Instructors should have enough knowledge and ability how to prepare PowerPoint presentations in terms of not only physical structure but also the content. PowerPoint presentations could be turned to typical teacher-centered instruction if instructors do not provide student participation by either asking discussion questions or having students participate in activities.
2. PowerPoint presentations are valuable tools to get student attention at the beginning of the instruction. The most important point here is to keep students attention and interest during the instruction. Visuals including pictures, animations or videos related to content may be helpful to keep student attention until the end of the instruction. However, since unrelated visuals may reduce student comprehension, it is important to pick up appropriate visuals and make the connection with topics. Keeping the balance between the text and the visuals is a key issue to prepare effective PowerPoint presentations.
3. PowerPoint presentations can be more useful if they are clearly organized and briefly summarize the topic. PowerPoint presentations with longer text and slides can have students lost their attention and get boring. PowerPoint presentations should have less but important information.
4. Although PowerPoint presentations are well-prepared, they should not be used all of the times. PowerPoint presentations should be supported by a variety of student-centered methods in which students may actively participate such as activities, experiments, group works, case studies, and discussions.
5. Handouts from PowerPoint presentations can be given to students beforehand. However, if the instruction does not depend on only the PowerPoint presentation, students probably will not think that the course exam will be covered only the handouts from PowerPoint presentations given by the instruction. Therefore, in this way, the attendance problem indicated in the literature will be also solved.

Moreover, based on the findings of the present study, further research is needed in order to investigate the effects of visuals, photos, videos presented on the PowerPoint presentations on student learning and to compare any differences of student learning between students given to handouts beforehand and students who do not receive any handouts.

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EFFECTIVENESS OF VIDEO MODELLING IN TRAINING STUDENTS WITH INTELLECTUAL DISABILITIES TO GREET FAMILIAR PEOPLE WHEN THEY MEET

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Abstract

This practice aims to teach students who have intellectual disabilities how to greet familiar people when they meet them. The purpose of this research is to see the effects of video modelling practice over the mental retarded students, when they meet familiar people. In this research, teaching the social skills to the students with mental retardations were evaluated with the effectiveness of teaching with video modelling, model of multiple probe design between subjects from research models of single subject design. In these research four students, whose ages range between ten to eleven attending a special education class at a primary school in Ankara and also have mental retardation are participated. The peers group consist of 3 girls and 2 boys who study at the same elementary school with the target students (all of them are 11 years old and continue their study at 5th grade class). Research findings were presented with video modelling in teaching students with intellectual disabilities Skill of Greeting Familiar People and acquire the skills to be effective after the end of the winning students in the application of these skills have shown that they continue to use. After the interviews done with the mothers and the teachers of the students about the results of teaching the skill of "greeting when meet familiar people" by video modelling, knowledge obtained is: they are satisfied with these skills to be taught to the students. They also expressed that the students have more interaction with their friends around them, more than earlier.

Keywords: Video modeling, social skills and intellectual disabilities.

Introduction

Social skills are important elements of behaviour for individuals to start and continue effective interaction. Social skills are defined as the ability to perform proper behaviour in social environments and play an important role in the establishment of interpersonal relations and realization of social objectives. Social skills make it easier for an individual to explain his positive or negative feelings in a proper way, defend his personal rights, ask for help from others when it is needed, and refuse inappropriate demands (Westwood, 1993).

It is possible to define social skills as the ability to interact with others in a specific social context. Social skills are learned behaviours that avoid negative reactions in interactions with other people and allow the possibility to receive positive reactions. But some individuals have problems gaining these behaviours (Cartledge ve Milburn, 1983). These individuals cannot interact well with the people around them because they lack these social skills (Avcıoğlu, 2005). As a result of this, the lack of social skills cause communication problems and also the individuals are not accepted by their peers (Karakuş, 2006).

Many social skills are generally learned unconsciously and in non-systematic way within peer groups and family. Individuals learn social skills by observing their families, other adults and their peers as a model. This is an unconscious and non-systematic learning method. But for the handicapped individual, this method is usually not valid. In other words, a individual with a disability cannot learn social skills by observing peers without a handicap. That is why social skills for handicapped individual are taught systematically and they need to be supported to use this ability (Thorkildsen, 1985). Thus, early intervention is required for the

development of social skills which are needed for social interaction. If early intervention does not occur, the individuals without social skills could be behind their peers in their social development (La Greca and Mesibov, 1979).
When teaching social skills to individuals, the observer must take care to define the necessary performance for their development and it is necessary to talk about these subjects (development characteristics of the individual, specifying the performance required for development) inside the programme. The first step in teaching social skills is to choose where to start according to the student's individual performance, and to choose what the priorities are for this individual. After deciding the priorities for the individual, an education programme must be developed (Westwood, 1993).
Many correction methods and educational programs prepared in this direction are used in teaching a social skill to an individual who has intellectual disabilities (Rustin and Kuhr, 1989). For example, Guralnik and Neville (1997) stated that for individuals in the pre-school period, using games to teach social skills can be effective. While Sargent (1991) suggests direct instruction, collaborative teaching, peer teaching, and cognitive processes method for all individuals, Wilson (2002) suggests verbal prompting, natural teaching and role playing games for teaching social skills. To develop social skills, while Pavlicevic and Ansdell (2006) recommend music therapy, Freeman, Sullivan and Fulton (2003) recommend the drama method.
When social skills are taught using different methods, visual support is often used (Genç 2010). The application of video modelling is the most widespread format in studies on the use of visual support (Genç.2010, LeBlanc, Coates, Daneshvar, Charlop-Christy, Morris and Lancaster, 2003). Teaching with video modelling is done by observing individuals who play a role in the video and take it as a model (Odom and Others 2003).
Nikopoulos and Keenan (2003) define video modelling as the occurrence of behaviour by an observer that is similar to the behaviour shown by a model on a videotape. Video modelling is the individual's target behaviours. It contains the observation of the video record of the model that illustrates the individual's target behaviours and contains the repetition of these behaviours (Charlop-Christy, Le and Freeman, 2000). The application of video modelling can be performed by anyone who participates in video recording (peer or adult) or observers as models (Nikopoulos and Keenan, 2006).
Video modelling is also defined as a process to change existing behaviour, or teach new behaviour with a non-living model and samples which are recorded on video (Dowrick, 1999). Consequently, video modelling includes watching a model in the video which helps the individual to change his behaviour or imitate the behaviour. In this process, first a skill is performed by a normal peer or adult and recorded to a video. Later in every teaching session this video is watched by the individual and later they are asked to imitate the same skill they watched (Le Grice, and Blampied, 1994). During the application of this method, generally individual are asked to pay attention to the video shown on the monitor in front of them. At the same time, the individual's behaviour while seated is rewarded (Corbett, 2003).
Video modelling, by decreasing educational tasks, reduces the needs for social interaction between the practitioner and individual. So it can be used easily not only by different practitioners but also by individuals with intellectual disabilities by themselves (Charlop-Christy, Le and Freeman, 2000). Additionally, another advantage of the method is it can be repeated as requested in the future to provide continuity of the skill taught and it can be used easily (LeGrice and Blampied, 1994). Because of this situation, it is possible to teach target behaviour and skills in an effective way to an individual with intellectual disabilities. This method can also be used in many environments, including in class or at home. It also contributes to learning the requested target skills and behaviour, facilitating the repetition of instant academic studies, providing feedback (Branham, Collins, Schuster and Kleinert, 1999), and providing an advantage in term of time (Rehfeldt, Dahman, Young, Cherry and Davis, 2003).
When this area has been researched it has been understood that video modelling is an effective way of learning motor behaviours, social behaviours, mathematic abilities, daily life skills and job skills for different types of disabilities (Nikopoulos and Keenan, 2006). Although video modelling is a very well known and widely used practice, it is not common in Turkey. In these studies, individuals with intellectual disabilities are taught pasta cooking skills Halisküçük (2007), services to the hotel floor Değirmenci (2010), teaching daily living skills Öncül ve Özkan Yücesoy, (2010) and the people who have autism problem are taught to be aware of bad people who may try to kidnap them (Akmanoğlu(2008). However, teaching social skills in individuals with deficiency in Turkey in recent years several studies have tested the effectiveness of different methods is seen between these studies, individuals with intellectual disabilities to become a model method based on the video that made the teaching of social skills has been encountered in any study. However, teaching social skills in individuals with deficiency in Turkey in recent years, several studies have tested the effectiveness of different methods is seen, Among these studies, individuals with intellectual disabilities to become a model method based on the video that made the teaching of social skills has been practiced in any study.
In this study answers to the questions below are being searched:
a) Is the teaching packet an effective way for students to gain, continue and generalize the skills of "greeting familiar people" to different people in different environments?
b) What are the opinions of the mothers and teachers in the school the students attend about the teaching of "greeting familiar people"?

Method

In this section, the research model, dependent variables, independent variables, participants, environment and equipment, study process, collection of data, and data analysis are given.

Research Model

In this research, the effectiveness of teaching social skills to students with intellectual disabilities with video modelling using multiple probe design between subjects from research models of single subject design. The experimental control of the research was provided with an increased occurrence with the implementation of training package based on video modelling at the starting level observed in the target students' interaction with their peers showed the target skills.

Independent Variable

The independent variable of the research is an education package prepared for the training of the target students "to greet familiar people" skills with the implementation of video modelling.

Dependent Variable

The dependent variable of this research is the learning level of the target students to greet people they are familiar with. The target skills are defined as follows and their learning level is evaluated accordingly: (1) to be aware of the familiar person when they encounter each other; (2) to approach the familiar person when they encounter one another; (3) to look at the familiar person's face; (4) to say words like "Good Morning/Hello/Hi"; and, (5) to wait for the answer from the familiar person.

Participants

The research consists of target students, peers, practitioners, and observers.

Target students

The participants in this research were four students of age ten or eleven who were attending a special education class at a primary school in Ankara and have a intellectual disabilities. Written permission documentation was taken from the parents for the students to be able to join the study which contained the following four items. 1) The students have never taken part in systematic learning related to the target skills that is the dependent variable of the research. 2) It is understood from the interviews conducted with the families and the teachers of the students that all four students need to learn the target skills. 3) It is expected for the students who participate in this research have some preconditioned abilities. 4) These abilities are listed below;

a) to have the visual ability to watch a video
b) to have a basic reading ability
c) to be able to join an activity for at least 20 minutes
d) to be able to focus on visual attractors for at least 15 minutes
e) to have receiving and expressing language abilities
f) to have minor and major muscular abilities which make the students able to show the target skills that they learned from the video they watched.

The teachers helped the researchers to select students who have the preconditioned skills as described above. Interviews were made with the teachers of the special education class where the students continue their study. By the end of the interview, three students who have the preconditioned skills were chosen. One reserve participant was also chosen in case the target student could not complete the research. The information about the students who participated in the research are described below. The target students' names used in this article are not their real names.

Orhan, 11 years old, studies in a special education class for intellectual disabilities students at an elementary school. He has the ability to perform self-care and daily living skills independently at a desired level. He has major and minor muscular skills that help him to perform the target skills independently at a level that is mentioned previous research. He follows verbal instruction independently. He can express himself with 4-5 sentences and he can answer the questions that are asked to him. He has reading and writing abilities. He can focus his attention on an event for a long period, and also works together with others and also in a group.

Efe, 12 years old, studies in a special education class for intellectual disabilities students at an elementary school. He has major and minor muscular skills that help him to perform the target skills independently at a level which is mentioned in this research. He has the ability to perform self-care and daily living skills independently at a desired level. He follows verbal instruction independently. He can express himself with 7-8 sentences, and he is able to make comments and answer questions. He has basic reading and writing abilities. He can focus his attention on an event for a long period. He can take responsibility and fulfil this responsibility independently.

Nurten studies in a special education class for intellectual disabilities students at an elementary school and is an 11-year-old student with a light level of intellectual disabilities. She has major and minor muscular skills that help her to perform the target skills independently at a level which is mentioned in this research. She has the ability to perform self-care and daily living skills independently at a desired level. She follows verbal instruction independently. She can express herself with 4-5 sentences and she can answer questions. She has a basic reading and writing abilities. She can focus her attention on an event for a long period. She can take responsibility and fulfil these responsibilities independently.

Ali is studying in a special education class for intellectual disabilities students at an elementary school and is a 12-year-old student with a light level of intellectual disabilities. He has major and minor muscular skills that help him to perform the target skills independently at a level which is mentioned previous research. He has the ability to perform self-care and daily living skills independently at the desired level. He follows verbal instruction independently. He can express himself with 7-8 sentences, is able to make comments and answer questions. He has basic reading and writing abilities. He can focus his attention on an event for long period. He can take responsibility and fulfil this responsibility independently.

Peers

The peer group consisted of 3 girls and 2 boys who were studying at the same elementary school as the target students (all of the peer group members were 11 years old and in the 5th grade). Two of these peers took a role in arranging the intervention sessions for the teaching video modelling. Three of the volunteer peers played the role of the peer's model to the target student in the research in the video the target student will watch. The peer and the target students have never known each other before. The Peers were chosen carefully and had similar features with the target student such as age and gender. The teacher provided input on the selection of the peers. The Peers in the research were never directed to Guidance and Research Center to be diagnosed, and consequently they were never diagnosed. The peers were selected based on their possession of the target skills and ability to participate as volunteer in this study. The Peers who participated in the research were not informed about the applications process and target skills.

Practitioner

The implementation of the target skills was performed by the special education teachers who work at the educational institution where the students were studying. The practitioner graduated from intellectual disabilities teaching programs and had been working for 5 years in the institution. They have experience working on social skills education. The person who will applied the application was briefed by the researcher, especially about the purpose of the research, dependent and independent variables, probe sessions (beginning level, daily probe, collective probe, generalization and monitoring sessions) and how intervention sessions are performed, behaviours of target student and how the practitioner will evaluate these behaviours, and how to use the video which will be used in the intervention sessions.

Observers

In the research, reliability data related to the dependent and independent variable were collected. Reliability among observers and reliability of the data in the application were collected by two special education teachers who graduated from intellectual disabilities teaching programs and finished their master degree in their field. Information on the following items were given to the observers of the research before they collected the reliability data:

a) the purpose of the research,
b) target skills and behaviours belonging to the target skills,
c) the strategy of education with video modelling,
d) intervention sessions,
e) probe sessions,
f) generalization sessions,
g) correct or incorrect presentation of the behaviour belonging to the target student skills
h) the expected reactions from practitioners in the situation of correct or incorrect presentation of the behaviour belonging to target student skills.

Environment and Equipment

The research was conducted in a gaming room which was permitted to be used by the institution where the target students were studying. The gaming room was a place where distracting stimuli were reduced and the students can sit and lay down comfortably as all places were covered by carpets. Data were collected for the beginning, probing, application and watching sessions of the students in the same environment. Data related to generalization were collected in the classes where the students were studying.

The following equipment were used during the research process: video clips where target skills were performed and peer modelling took place; external memory where the video clips were recorded; laptop; video camera; tripod; 82 inch TV; and, a control list including the target skills. Additionally, to reinforce the target students and peers who played in the video for the training of target skills, various toys and types of food were used.

The camera shots were taken with three peer models related to target skills before the study began and recorded onto a CD. The peer model was told that they would perform the skills of greeting familiar people when they met them, this event would be recorded, and later the events they performed would be watched by other peers for skill training. The peers were told their role and the tasks to model (what would they would do during the shooting) beforehand and they were recorded using the camera during the session. The video that was created was watched by three experts and their opinions were taken. All the experts expressed that the video images were prepared properly for the purpose of the training.

Study Process

In this section pilot study and study process are described.

Pilot Study

Before starting the research, a pilot study was completed for the purpose of obtaining information about whether the educational package using the video modelling prepared earlier was applicable or not. The educational package developed and the pilot study of the data collection instruments were applied to a student who has similar characteristic features to the target students. Cemil, the student who participated in the pilot study, was 10 years old and studies in a special education class at an elementary school in Ankara. In the student's school information it was written that he has a mild level of mentally disabled. The results of the evaluation made by Counselling Research Centre said that the student is intellectual disabilities and can be trained and prepared to continue his study in a special education class. He has major and minor muscular skills that help him to perform the target skills independently at a level which is mentioned in the research. He has the ability to perform self-care and daily living skills independently at a desired level. He follows verbal instruction independently. He can express himself with 7-8 sentences, is able to make comments and answer questions. He has basic reading and writing abilities. He can focus his attention on an event for a long period. He can take responsibility and fulfil this responsibility independently. He can work with others and study in a group. The pilot study was performed in the same gaming room where the study would be performed. At the end of the study, it was noted that the video clips that the peers are played role model in the video, which would be used in the training of social skills and the events are understandable, so the students could watch the video clips easily and they could join the events.

Baseline sessions

Baseline sessions were recorded using a video camera. The practitioners collected data for the baseline sessions by watching this video for the target behaviours inside the group (the target skills which were stated as the dependent and independent variables). The target behaviours were evaluated during the free game events between the target students and peers by observing the behaviours of interaction. In this stage, a video on the CD was not watched and no training was done. In this session, reinforcement was done verbally until the students' performance was at an acceptable level. In cases where the skills were not performed, or were not performed to an acceptable level, the situation was ignored. The practitioner asked the target students and peers to play a game about what they do when they meet familiar people and the students were told "Come on kids, let's play together" presenting the target warning and the students were asked to interact with their peers by playing the game. After the target stimulus was presented, the behaviours that occurred during the interaction between students and peers over 30 minutes were observed. Until stable data were obtained over 3 consecutive sessions for every single student, baseline data were collected. The probe sessions were conducted in a manner similar to the baseline sessions.

Intervention Sessions

The teacher's ideas were selected as the references for choosing the skills to be taught. To do this, first the teachers were asked to define which social skills the students needed and they had to order these skills according to the degree of importance. According to the skill "greeting when meeting familiar people" was defined as the priority skill that they needed. Because the research was done for students who are mentally retarded, the observer was aware that the students had never taken part in social skill education before the practice related with the target skill was performed. For this purpose, the mothers and the teachers were asked not to give any education related to these skills. The teaching of the target skill begun simultaneously and it continued as a teaching session for 30 minutes per day and 4 days per week. The intervention sessions, the criteria are met at the level of teaching up to three sessions of 100% has been maintained.

The videos were watched in the game room in the school that the students were attending. In the video model which was shown, there were three types of peer models. The sample activity related to the target skill was prepared by using the model peers. The model peers were instructed to perform the behaviours which took place inside the target skill and it was also indicated that they would be the model in this way. Before beginning the intervention sessions the practitioners introduced him/herself and the devices like TV and Video CD which would be used during the practice. And also a short explanation has been made about the target social skill. The students were told that they would first watch the video images about the target skill and then they will perform the behaviours which they saw on the video.

They were also told that the video images were a kind of game that was being played by their peers and after they watched that game they would also play this game, too. The practitioner also told the students that while playing the game both their peers and themselves had their tasks and they had to change these tasks in a specific order. Subsequently, explanations about the tasks inside the activities were given and questions were asked to understand if these tasks were understood in the correct way or not. The students were asked if they understood what they had to do while playing the game. In case the student did not understand what he had to do for a task a new explanation was made. The student was also told that if he/she completed the task in the correct way he/she would be awarded at the end of every session.

After being sure that the target student was fully concentrated on the practice and when he/she was ready, the practice began. The practitioner then told the students "First, let's watch what we have to do when we meet familiar people" and then they watched the video related with this subject. While watching the video explanations about the images were given to the student. For example: "Look. In the images we are watching now, there are students who are at the same age with you. Let's see what they are doing." After watching the video, the video was stopped and the students were told "Let's do what you have seen in the video, together" After that the students and peers were encouraged to do the processes defined in the activity together. The students and peers were

made to tell the story which they had seen in the video to each other and then the activity related with the target skill began. After the tasks were completed in an ordered way, the activity was finished. Afterwards the students were asked to summarize what was done in the activity and talked about where and how to use the skill inside the activity. The practitioner evaluated the ability of the students to perform the tasks during the practice and then provided feedback to them. The students were thanked for everything they did during the practice and the session was ended. This process was applied to all 3 students.

When the student performed the behaviour related to the target skills in the right way, the student's behaviour was reinforced verbally like "Bravo! You did what you saw on the video. Really good". When the student could not perform the behaviour, they made the student watch the skill's steps again. The practitioners asked them to repeat the behaviour of the target skills again after the student had finished the watching process. After watching the video again, if they performed the behaviour skill in the right way, the student's behaviour was reinforced verbally with the sentence "Bravo! You did what you see on the video really well", and (+) sign was put into the form in the column where "student can perform the skills at an acceptable level" was written. When a student could not perform any of the behaviour skills even after they watched the video twice, or even if they performed the skills required but not at an acceptable level, a (-) sign was put into the column where "could not perform proper behaviour, after they performed the behaviour skills with the practitioner correctly" was written, and they continue to watch the CD. This process was repeated until they could perform all the desired behaviours at an acceptable level.

Monitoring Sessions

Monitoring sessions were organized like the baseline sessions one, three and four weeks after the teaching session.

Generalization Sessions

To evaluate if the target skill was being generalized to different people and different environments for the target students, generalization sessions took place. Generalization data were collected five days after all the students fulfilled the standard requirements for 3 consecutive sessions. The teacher was informed about the practice in the generalization sessions. The video images were not shown to the students like it was in the intervention sessions. In the class environment the student was asked orally "what we do when we meet familiar people" and the student was requested to perform the target skill. The target student's performed skills were recorded at that time and the average points of these data were taken as the target skill's generalization data. The practitioner reinforced the target students with the reinforcements for the target skills which they performed.

Collection of data

In the research three kinds of data were collected in order: 1) effectiveness; 2) reliability; and, 3) social validity.

Collection of Effectiveness Data

All the sessions were recorded by using video cameras and the research data were collected by the practitioner by watching these records. In this research during the period of collecting efficiency data on the target skill, the correct and incorrect behaviours of the target students were recorded and the percentage of the correct behaviour rate was calculated. During the evaluation period of the target skill, data related to five different types of behaviours were collected.

1) Recognizing familiar people when the students meet them (posture, gestures and facial expressions)
2) Getting closer to the familiar people when the students meet them.
3) Looking at the face of familiar people.
4) Saying at least one of "Good Morning or Hello or Hi" and
5) Waiting for the reply from the familiar person.

In every session during the learning period, the ability to demonstrate the target skills was evaluated at every stated level.

In every case, student behaviours were classified as one of three types: 1) The student could not demonstrate the skill; 2) The student could show the skill but not at an acceptable rate; or,

3) The student could demonstrate the skill at an acceptable rate.

The percentage of the behaviours was calculated and the result data was processed graphically by putting "+" on the data collection form when the student demonstrated the skill at an acceptable rate or putting "-" on the data collection form for other cases.

Collection of the reliability data

a) Reliability among the observers, and b) Practice reliability data were collected as the reliability data in this research.

The inter-observer reliability data of the research was collected by two special education specialists who were granted master degrees from the division of intellectual disabilities education and special education. The observers of the research were educated as observers. The inter-observer reliability data were collected by the observers watching the video records of at least 30% of the sessions related to the start, practice, probe, generalization and permanence stages. The calculation of reliability among observers was done by using the formula [(consensus) / (consensus + dissent)] x100. For the target skill all three experimenter's reliability percentage related to the start, probe, generalization, practice and permanency level sessions was found as 100%.

The practice reliability data were collected with the form "greeting ability when meeting familiar people-education packet's practice reliability data collection".

Practice reliability data

a) the practitioner introduced himself and the tools like TV, video CD that would be used during the practice; b) the practitioner explained the instructional goal and the target skill to the students; c) the practitioner explained what kind of tasks the students would have during the practice and how they would officiate their tasks; d) the students practice where to focus on the video; e) the practitioner provided the video on the CD for the students to watch; f) the practitioner explained the images to the student while they were watching; g) Presentation of the skill directively; h) Providing the students to do the activities which are defined at the practice inside the video. i) Providing all the students to try the various roles inside the activity. j) asking questions about the group practice at the end of the activity. k) Providing the students to summarize the things they watched inside the video and the things they learned at the activity which they practiced and providing them to understand where they could use this knowledge. l) Giving appropriate reaction for the behaviours that the target students showed (the behaviour to be reinforced while it was shown at the acceptable rate, in case of the behaviour to be shown in a false way: repeating the period of learning by presenting video feedback) and m) The student's reinforcement behaviour of the participation behaviour was observed and according to these observations; the practiser's true behaviours were signed as "+" and false behaviours are signed as "-"to the form. Subsequently, the number of correct behaviours was defined and processed on the form by calculating the percentage. The practice reliability data was collected in all of the experimental sessions. In 30% of all sessions, practice reliability data were obtained by the observer (Tekin and Kırcaali-Iftar, 2001). The results of the practice reliability data was detected as 100% in every teaching packet that was related with the skill which was to be taught to a student.

The collection of the social validity data:
In this research interviews were done with the mothers of the students and the teachers at the school they attended to communicate the importance of being able to greet familiar person when they meet. After the research ended, images from the beginning and final periods of the research were shown to the mothers and teachers separately. The mothers and teachers were then asked to evaluate the appropriateness of the obtained results.

Data analysis
The data obtained by the social skill practice which was performed in this research were graphically resolved. Linear graphic technique is one of the graphical analysis techniques used to resolve the data. The points of the students related to their ability to perform the skill were shown in equal intervals between 0 and 100 on the y axis. Start, Teaching, Probe, Watch and Generalization data were numbered over the x axis and shown in equal intervals. The social validity data which were obtained by semi structured interviews done with the mothers and teachers were resolved with the descriptive analysis technique.

Results

In this section, the continuation results of the students to gain the target skill were integrated with results related with the generalization to different persons and environment. The idea about the social validity of this research of the intellectual disabilities students' mothers and their teachers who are joined this research also took place at this section. During the practice period the change from one stage to another stage was defined based on 100% measured fulfilment of the target skill.

Results related with levels of gaining the ability of greeting someone familiar, continuation and generalization
The results related with the levels of every single student who joined the research to gain the target skill to continue and generalize are shown in Figure 1.

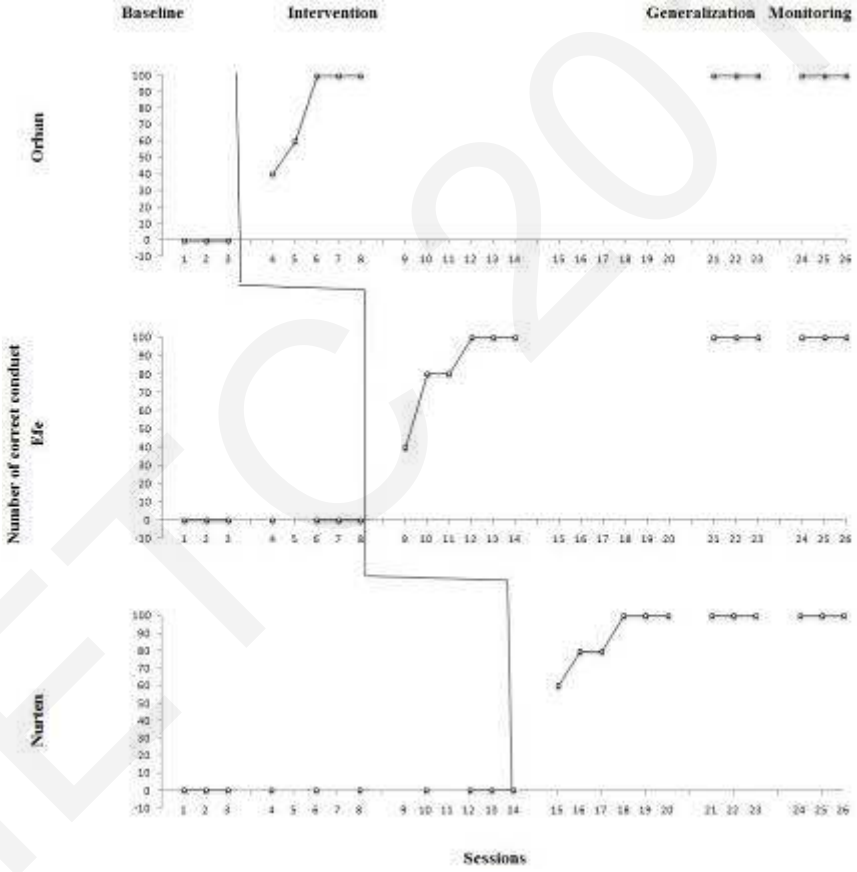

Figure 1.
Baseline, intervention, generalization and monitoring data sessions which is related with the student's target skill

As shown in the figure, at the beginning phase, the first student Orhan does not have the target skill. Because stable data were obtained in three start level sessions, the observer moved into the teaching phase of the target skill. The percentage of correct response for the target skill changes between 40% and 100%. Orhan performed the target skill which was organized at the practice phase's 3rd, 4th and 5th sessions at the acceptable level of 100%. The defined criterion was fulfilled and the skill's teaching phase was finalized because this level was performed at an acceptable level.
It is observed that the second student Efe does not have the target skill at the start level phase. The observer started teaching the target skill after stable data were obtained in three start level sessions. The correct response percentage changes between 40% and 100% for the target skill during the teaching phase. Efe performed the target skill at the practice phase's 4th, 5th and 6th sessions at the acceptable level of 100%. Because this performance is an acceptable performance, the defined criterion is fulfilled and the skill's teaching phase is finalized.

As is observed from the Figure, at the start level phase the third student Nurten does not have the target skill. Nurten's correct response percentage of the target skill in the teaching phase changes between 60% and 100%. Nurten performed 100% acceptable range of the target skill in the 4th, 5th and 6th sessions of the practice phase. Because this is a level of performance which is acceptable, it fulfilled the defined criterion and the skill's teaching phase is finalized. After the teaching related with the three students Orhan, Efe and Nurten is ended, it is observed that they have performed the target social skill at a 100% level which is the acceptable level.
As is seen in Figure 1, for all three students who have joined the research, it has been founded that all of their correct response percentage is 100% of the target skill in the generalization sessions to different people and different environment. It is observed that the teaching final data and the generalization data are at the same level for all of the target students.

The reviews of mothers and teachers about the social validity of the practice
In the research the practice's social validity is observed by asking the opinions of the students' mothers and teachers about the subject which generates the research's target skills teaching that is described as "greeting when meeting familiar people" and the subject that is defined as "teaching this strategy using a video model." According to these opinions, all the mothers and teachers of the students who joined the research are satisfied with the target skills being taught and the teaching to be done by an expert. Once again, they expressed that these skills being taught to the students are very important for them. They also expressed that it makes the students more social when they greet their friends and makes it easier for them to have more social interaction, and again these interactions help them to be more social. And the mothers and teachers also express that "Beyond their familiar friends, they have more new friends compared to the past." The parents and teachers also said that the students use this skill that was taught to them in their daily life, at home, at school and on the street.

Discussion
In this research the effectiveness of the subject "video modelling to teach the skill of greeting familiar people when they meet to mentally deficient students" is observed. The observer tried to understand the views of the students' mothers' and teachers' about the subject of the target skill's teaching studies conducted by video modelling and they obtained discoveries. At the end of the discoveries obtained from the research, it is understood that teaching using video modelling is effective for the target skill to be taught for the students. Additionally, at the end of the research it is understood that the students can generalize this skill to different environments and people and they can continue this skill after the practice ends also. The social validity data which was collected from the mothers and fathers of the students shows that, their opinion about the target skill's being taught to the students who are mentally retarded, is positive.
These results show similar specialities with other researches that are "skills of understanding emotions with the skills prepared of teaching studies with conducted video modelling" (Bernard-Ripoll, 2007), communication and speaking skills (Allison and Dorothea, 2010; Sansosti and Powell-Smith, 2008; Scattone, 2008; Sherer and others, 2001), emotion comprehension skills (Bernad-Ripoll, 2007), the skill of starting relationship (Nikopoulos and Keenan, 2003), the skills of playing games (D'Ateno, Mangiapanello ve Taylor, 2003; Paterson ve Arco, 2007), game-playing skills (D'Ateno, Mangiapanello ve Taylor, 2003; Paterson ve Arco, 2007), social interaction skills (Bellini, Akullian ve Hopf, 2007; Bidwell ve Rehfeldt, 2004; Kroeger, Schultz ve Newsom, 2007; Maiona ve Mirenda,2006) and decreasing and increasing inappropriate behaviours (Cihak, Fahrenkrog, Ayres and Smith,2010; Graetz, Mastropieri and Scruggs, 2006) over the subject of teaching studies with conducted video modelling.
Because video modelling is effective at teaching oral and motor behaviours, social behaviours, mathematical skill, daily life skills, job skills, skills related with safeness, attention disorder and coping with problem behaviours in different groups of disability, it takes place in the offered methods (Nikopoulos and Keenan, 2006). Because the teaching done with video modelling is a kind of visual teaching, it causes the target behaviour to be described clearly so it provides more advantages relative to the traditional methods and it gives the possibility for the practice to be more useful and effective. This makes things easier especially for the students who have disability. Teaching studies with video modelling also causes the care times for the subject that is studied to be longer and increases the care and interest. By this way it is understood that distract ion is minimized (Pierce and Schreibman, 1994). This state increases the motivation of the students and causes it to be a method that the students like (Screibman, Whalen and Stahmer, 2000). An advantage of this method is that it costs less than the method of using live models. The teachers can use these videos not only for the target students, but also for the students who have similar disability. Video clips give the possibility of presenting the critical steps of the skills again to the teachers. So the teachers can prepare a time period by using the videos that they can use again for being able to describe many functional skills. Because of this advantage video modelling method is an appropriate teaching strategy for mothers and fathers (Ayres and Langone, 2002; Banda Matuszyny and Turkan, 2007; Corbett, 2003; Graetz, Mastropieri and Scruggs, 2006). In this practice the number of intervention sessions can be reduced, which is one of the method's advantages. The state which causes this result is one of the strengths of the research.
The observer must evaluate the special characteristics of a student before he decides what to teach. The observer must decide which social skill to be taught and if the social skill to be taught is necessary or not for the student, according to the realization of the inadequate skills and the skills which the student already has. To define where to start the teaching of the skill must begin for the students and to define which skills have more priority just to observe what the student does or what the student does not do is not enough, it is also necessary to define what kind of social skills the student needs first (Cartledge and Milburn, 1986; Rustin and Kuhr, 1989). It could be said that one of the most important steps for the teaching practice done in this research to be effective is for the observer to define the inadequate and prior social skills and select the target skill according to this definition. The target skill which is "greeting when they meet familiar people" is one of the social skills that gives positive results for the students at school, home and also in other environments.
Another result of the research shows that, the students who have intellectual disabilities still continue to perform the target skill after the first time they obtained it, in the first, third and fourth weeks, at 100% level. Also in the generalization results, it is defined that the students could generalize this target skill for the different environment and different people at 100% level. The possibility of using video modelling which is thought to be used effectively and efficiently while educating the students who have special needs in recent years, presents the opportunity of different examples for the practitioner and the student and gives many benefits like high control, the ability to use the same models repeatedly and to be able to be use the videos personally during the period of being model. It is proposed that these benefits make it easier for the taught skills to be continuous and generalized (Rehfeldt and others, 2003). The results obtained from this research which is about permanence and generalization is consistent with this knowledge.

Based on these, it can be thought that the results of the research which are about the permanency and the generalization, can contribute to the literature of the effective teaching.
After the interviews were completed with the mothers and the teachers of the students about the results of teaching the skill of "greeting when meet familiar people" by video modelling, the knowledge obtained is that they are satisfied with these skills to be taught to the students. They also expressed that the students have more interaction with their friends around them than previously. This knowledge presents the importance of the social skill which is greeting ability that was mentioned by La Greca and Mesibov (1979), which is necessary for successful peer communication. In the same way, Knapczyk, Rodes (1996) and Westwood (1993) also mentioned about the importance of greeting and they emphasized it is a very important skill to be able to reach an average level of social adequacy and to have a successful social interaction. It is possible to say this practice's social validity is high based on these data. So it is also possible to say that the greeting ability which was taught in this practice is an important social skill and it benefits peer communication also.
According to the results, the following conclusions can be offered:
Both special education class teachers and general education class teachers can try video modelling for the teaching of different discipline subjects in the class environment for the appropriate behaviours to be increased and decreased. Seminars about how to do teaching by video modelling can be done for the teachers. The effectiveness can be researched by applying it over the development of the mental retarded students in different fields, and decreasing the inappropriate behaviours. For the purpose of increasing the generalizability of the research results, the research can be repeated in different environments by different researchers and by teaching different skills. In this research the results can be compared to each other by applying the teaching packet which was prepared for the mental retarded students, according to the video modelling method over different groups of retarded students. It can be observed if it differs or not during the phases of teaching social skills by video modelling to the students who are mentally retarded. Those phases are modelling, modelling acquisition, monitoring and generalization. It can be observed if it differs or not during the monitoring and generalization phases of video modelling related with the adult model and peer model and see if the effectiveness changes or not during these phases. Research can be done about the study of certain behaviours to be increased or decreased by the teacher centred traditional teaching methods and also about comparing this video model method in terms of effectiveness and efficiency. In addition to observing the effectiveness of the social skill teaching packet, qualitative analysis can be added and qualitative data can be collected. Finally in this research the social validity data are collected from the teachers and the mothers. In the advanced research it can be offered to collect social validity data from the students' themselves, their brothers and sisters, their friends and their fathers. This research has been limited to 3 students and their ability of "greeting when meet familiar people". In advanced researches this practice should be repeated by using different skills.

Kaynakça

Akmanoğlu(2008) *Otistik çocuklara kötü niyetli yabancı kişilerin kaçırma girişimlerinden kaçınmayı öğretme*. Yayınlanmamış doktora tezi, Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü.
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