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"The International Educational Technology Conference (IETC)" is an international educational activity for academics, teachers and educators. IETC promotes development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities, journals (TOJET, TOJNED and TOJDEL) and proceeding books. Its focus is on sharing, creating and disseminating knowledge among academicians, school administrators and teachers about the use of instructional technology for learning and teaching in educational field. This conference is now a well-known educational technology event worldwide and the number of paper submissions and attendees are increasing every year. This year more than 350 papers from more than 20 different countries have been submitted for and distinguished keynote speakers have been invited to participate in this academic event.

This year The Association of Science, Education and Technology (TASET), Sakarya University, İstanbul University, Governors State University and TOJET are collaborating with Association for Educational Communications and Technology (AECT) in organizing the 15th International Educational Technology Conference - IETC-2015 which will be a combined academic event with IRSEM, International Research Symposium on E-Learning and New Media on May, 27-29, 2015 in Istanbul University, İstanbul, TURKEY.

We would like to thank you for your participation and contribution to the success of IETC 2015. We wish you have a pleasant stay in Turkey and enjoy beauties of the great city of Istanbul and hospitality of Turkish people.

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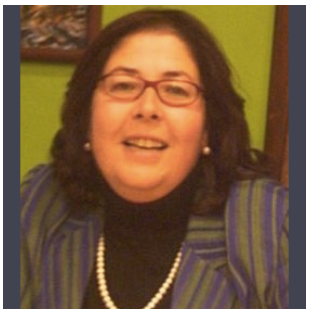
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A Blended Learning Approach Towards Teaching Network Security

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Abstract
Traditionally teaching network security is implemented in classroom setup format where students accept learning style in a traditional face to face where it is common to have one way communication also known as Teacher Centre Learning (TCL). In this setup, students normally received education by being fed of the knowledge by the teacher. This experiment is intended to determine the preference of students for their learning environment as well as the learning styles between (TCL) vs. Student Centred Learning (SCL) in a blended environment.

Introduction

Learning about the network security requires effective and active learning environment and equipment in order to maximize the student's learning experience. Traditionally teaching network security is implemented in classroom setup format where students accept learning style in a traditional face to face where it is common to have one way communication also known as Teacher Centre Learning (TCL).

In a Student Centred Learning (SCL) learning environment, students are given a problem solving scenario or task where the teacher acts as a mentor or facilitates the activities. Student discuss among themselves to complete the required assignment. This style of learning is actually much more used and preferred by majority of the learners. This learning style enables student to construct knowledge through gathering and synthesizing information while integrating it with the general skills of inquiry, communication, critical thinking, problem solving and so on where students actively participate. In this case, students learn by being cooperative, collaborative and supportive where lecturers and students can learn together. Besides, the students actually apply the knowledge they currently learning to effectively address enduring and emerging issues and problems in real-life contexts.

Currently the TCL teaching method in the Universiti of Malaysia Terengganu (UMT) is conducted in a mix mode with an online system where students can access the course materials submits exercise, do online quiz and test. However we do not have at present any physical hardware support for teaching network security.

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This experiment is intended to determine the preference of students for their learning environment as well as the learning styles between TCL vs. SCL in a blended environment.

Methodology

The Methodology is the general research strategy that outlines the way in which a research project is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated (Howell, 2013).

The main method for this research is basically using survey research technique. Survey research involves the collection of information from a sample of individuals through their responses to questions. Surveys represent one of the most common types of quantitative, social science research. In survey research, the researcher selects a sample of respondents from a population and administers a standardized questionnaire to them.

Survey research is used by many researchers to its versatility, efficiency, and generalizability. For its versatility, although it is not a completely ideal method to learn all kinds of processes but a good survey can improve our understanding about any matter at hand. It can be said that almost for all kinds of topics, it is hardly to find that the survey method is not usable for certain researches.

In order to conduct the survey measurements, we choose a likert-scale type. A likert-scale is a psychometric scale commonly involved in research that employs questionnaires. Likert (likert, 1932) developed the principle of measuring attitudes by asking people to respond to a series of statements about a topic, in terms of the extent to which they agree with them, and so tapping into the cognitive and affective components of attitudes. Likert-scales have the advantage that they do not expect a simple yes / no answer from the respondent, but rather allow for degrees of opinion, and even no opinion at all. Therefore quantitative data is obtained, which means that the data can be analyzed with relative ease.

Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling, 1997; Burns, & Grove, 1997). These ordinal scales measure levels of agreement/disagreement.

For statistical purpose, this research uses a lot of interval scale questions which focuses on agreement strength, likelihood or satisfaction. A typical five-level likert-scale is used in the research. Generally, the level of agreement or disagreement is measured and it is considered

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symmetric or "balanced" because there are equal numbers of positive and negative positions. Often five ordered response levels are used, although many psychometricians advocate using seven or nine levels; a recent empirical study found that items with five or seven levels may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from the use of 10 levels, and this difference was statistically significant. (John, 2008). In other word, a likert-scale measures attitudes and behaviours using answer choices that range from one extreme to another.

In this research, the targeted respondents are for the Network Security students for Semester I 2014/2015 at School of Informatics and Applied Mathematics, UMT. The scenario is that before the midterm semester break, the respondents are actually learning using TCL style which the lectures and activities are held in a class. After the midterm semester break, the learning style becomes combined with TCL and SCL which the lectures and activities are held in a laboratory setup. In both cases, the students can still access the online materials.

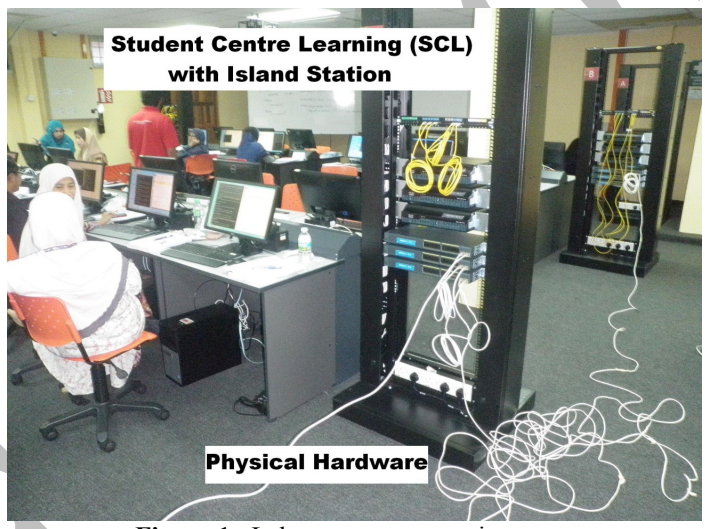


Figure 1 : Laboratory setup environment

The laboratory was design to fit a SCL learning environment which currently consists of 8 island stations with max of 6 students per station. Each station is equipped with desktop computers and internet access. In the laboratory, the teacher act as facilitator to assist a problem based scenario based on real life problems. Each island station will have an elected leader to lead their group discussion. As a remark, the laboratory has physical hardware support for CISCO network and data communication support classes but not for network security class

(refer to Figure 1).

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Result analysis

1. In this survey, the questions are divided into two parts where the higher the number of average result of questions from number 1 to 12 (refer to question tabulation of Table 1), the better the preference of students while the higher the number of average result of questions from number 13 to 18 (refer to question tabulation of Table 2), the lesser the preference of students. The survey was conducted using likert-scale with 34 respondents collected. The resulted average is based on this scale measurement.

Question	Average
Part 1 (Range from Strongly Disagree to Strongly Agree)	
1) I found that the learning style before semester break is interesting.	3.44
2) The lectures before semester break are interesting.	3.23
3) I found that after semester break learning is more interesting.	3.50
4) The lectures after semester break are interesting.	3.38
5) I feel much more enjoyable after semester break.	3.41
6) I feel much more motivated to learn after semester break.	3.29
7) The lectures and activities after semester break helped me learn and understand the lecture.	3.47
8) After semester break, I felt more self-confident in learning the course module.	3.35
9) The learning materials and activities after semester break are much more effective.	3.50
10) Overall, I think the learning style after semester break has expanded my knowledge.	3.47
11) I prefer very much the learning style after the semester break.	3.47
12) I found that team work helps me to understand and solve problems better.	3.26

Table 1: Question design for better preference of students

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Part 2 (Range from Very Easy to Very Difficult)	
13) How did you find the content of lecturers before semester break?	2.52
14) How did you find the content of lecturers after semester break?	2.71
15) How is your understanding on the lectures before semester break?	2.68
16) How is your understanding on the lectures after semester break?	2.71
17) How did you see the team work among the students before semester break?	2.65
18) How did you see the team work among the students after semester break?	2.53

Table 2: Question design for lesser preference of students

From the first part of results, we can see that the students completely prefer SCL over TCL. First, the learning style is more interesting using SCL than TCL (3.44 to 3.50), it is also the same for the lectures which is more interesting for using SCL than TCL (3.23 to 3.38). Taking 2.50 as the median between strongly disagree and strongly agree, we can also see that students preferred SCL for being much more enjoyable (3.41), motivated (3.29), lectures and activities help in learning and understanding (3.47), more self-confident (3.35), learning materials are more effective (3.50) and learning style expanded their knowledge (3.47). Lastly, they also found that team work in SCL helped them to understand and solve problems better (3.26).

For the second part of results, there exists some inconsistency in the preference of students. For the contents, it seems to be more difficult to find using SCL to TCL (2.71 to 2.52). For their understanding, it seems that is not much difference between using SCL and TCL (2.68 and 2.71). Lastly, they feel the team work in SCL compared to TCL is much easier (2.53 to 2.65).

Conclusions

This survey was conducted in order to find out the students preference between blended TCL and SCL. Based on the experiment, we can conclude that students preferred a blended SCL approach more than TCL. The result of this initial study phase is important to know and understand and enhance learning experience of students by knowing the much preferred learning styles in preparation for the next level.

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A Learning Model To Develop Critical Thinking In University Students Using A Health Promotion Constructionism-Based Website

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Abstract

Critical thinking is one of the 21st century skills required for learners. Kasetsart University (KU) recognizes this importance and continuously invests in various intra-curricular and extra-curricular activities to ensure that its students are able to develop and apply critical thinking in their studies and daily life. In this study, a health promotion constructionism-based website was used to develop critical thinking skills. The research's aims were 1) to create a learning model which used to develop critical thinking in KU students using a health promotion constructionism-based website 2) to compare critical thinking skills before and after using a health promotion learning website. 3) to examine student satisfaction with the website. The total of 21 students was selected using simple random sampling from 873 students year 1 to 4 of Faculty of Education during the second semester of the 2014 academic year. Data were analyzed using mean, standard deviation, and dependent samples t-test. The result of the study was the 10 Step CT Model. The model consists of 10 steps which are:- 1) preparation, 2) proposing issues, 3) searching, 4) data collection,5) diagnosis, 6) discussion, 7) choosing best choice, 8) implementation, 9) presentation, and 10) evaluation. After using health promotion learning website, students gained higher critical thinking scores than before using health promotion learning website at .01 significant level. Students also expressed the highest level of satisfaction with the website.

Introduction

One of the main strategies of the Eleventh National Economic and Social Development Plan (NEDS) (2012-2016) is to develop human qualities toward a sustainable and knowledge-based society (NESDB, 2011). Pheeraphan and Sompong (2013) proposed that " the students in today's world must have the essential skills to be successful in the 21st century life and workplace, such as information, media and technology skills, communication and collaboration skills, problem solving skills and critical thinking skill". Various measures should be applied to enhance qualities of Thai people in all aspects, including physical and mental strength as well as intellect. Web-based learning plays an essentail role in moving and integrating knowledge and learning activities (Rampai and Sopeerak, 2011). Health promotion, which can enable people to control and improve their heath, plays a vital role in enhancing human strength both physically and mentally. As enhancing intellect involves promoting mental abilities to understand and solve problems, critical thinking skills should be developed among Thai citizens.

Health promotion was chosen as a main subject to learn while constructionism theory was used to develop critical thinking skills. Most graduate students at Kasetsart University, in

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particular students of Faculty of Education learn Health Subject during their academic years. Nevertheless, some health related topics are electives and students sometimes do not study the subject during the semesters. The students participated in this research were ones who expressed their interests to learn the subjects in their spare time. Six important heath promotion topics were the main focus of the study consisted of health and health care, nutrition, exercise, stress management, environmental health and quality of life. Sirisopon and Sopeerak (2013) studied the web-based instruction model using an open-source learning management system and found the students satisfied with website under Creativity CT Model. In this study, however, the researcher chose an educational social media website, Edmodo as a platform for uploading health related contents due to its similarity with the popular social media website, Facebook. This means undergraduate students who participated in this research voluntarily had an ease to start learning the contents and other web-based instruction and did not require much time to learn how to use the website since they all had Facebook's accounts. As the students learned six heath promotion topics on Edmodo on their free time, the author believed the easiness of the web-based instruction was essential to self-paced learning and participation levels.

Objectives

1. To create a learning model based on constructionism theory.

2. To compare critical thinking skills of students before and after using a health promotion learning website.

3. To examine student satisfaction with the website.

Research design

The research was divided into four phases as follows:

Phase 1: Review literature and meta-analysis previous studies and research on learning methods using constructionism and uses of social media in developing critical thinking. Most used methods and processes from literature review and meta-analysis were used to create a prototype model of the web-based Instruction for developing critical thinking skills. A focus group technique (consisting of ten experts from three related fields; constructionism, web-based learning and critical thinking development) was subsequently utilized to improve the prototype model. The result was a learning model (the 10 Step CT Model as shown in Figure 1) for web-based instruction based on constructionism theory for developing critical thinking.

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Phase 2: Develop personal and community health promotion web-based contents on a social media website (Edmodo) based on the 10 Step CT Model, web-Based Instruction suitability assessment and satisfaction questionnaires. The model was evaluated through the personal and community health promotion website. The research used one group pre-test post-test design (Campbell and Stanley, 1963).

Phase 3: Conduct field trial for 7 weeks to evaluate the use of personal and community health promotion web-based based on constructionism using the 10 Step CT Model in the real life setting.

Phase 4: Assess the use of personal and community health promotion web-based based on the model. This phase took 7 weeks. Each week students learnt various heath contents uploading on a social media website (Edmodo) and materials provided by the researcher. At the end of each week, students chose one health problem issue that interested them, and studied through the web-based instruction designed by the researcher.

Populations and sample:

The populations were 873 students year 1 to 4 of Faculty of Education during the second semester of the 2014 academic year who were interested in learning about personal and community health promotion in their free time. The sample was 21 students selected by simple random sampling.

Research instruments

Cornell Critical Thinking Test (Level Z) (Ennis, R.H. and Millman, J., 1985) which was developed and translated into Thai language by Asst. Prof. Dr. Panita Wannapirun. The test took 50 minutes and consisted of 52 questions for testing six critical thinking skills (Ennis, 1985).

Data collection

Students took Cornell Critical Thinking Test in the first week before the experiment started and in the seventh week. Results from the tests were analyzed using Dependent Samples t-test. Satisfaction questionnaires were also completed at the end of the experiment and subsequently analyzed using Mean and Standard Deviation.

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Findings

I. The 10 Step CT Model

The result from phase 1 of the research was the 10 Step CT Model (as shown in Figure 1) based on constructionism theory for developing critical thinking. The model consists of 10 steps: - 1) preparation, 2) proposing issues, 3) searching, 4) data collection, 5) diagnosing, 6) discussion, 7) choosing the best choice, 8) implementation, 9) presentation, and 10) evaluation.

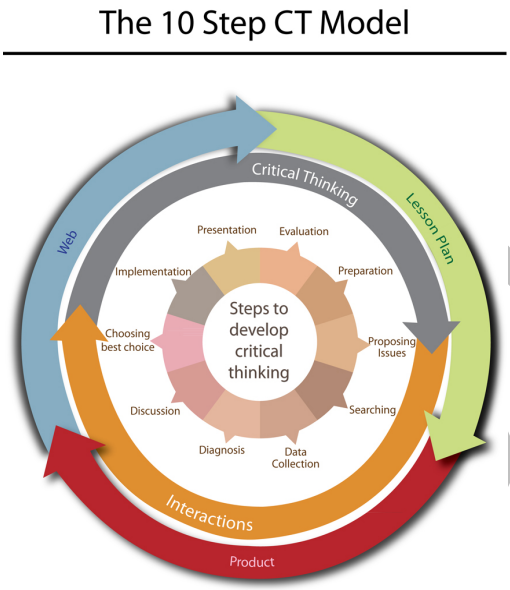


Figure 1: The 10 Step CT Model

<u>Step 1 Preparation</u> (as shown in Figure 2)

This first step prepared students to be familiar with the web-based instruction. Students got to know each others and the researcher. Students were informed the learning objectives, lesson plans and self-paced intruction to learn heath promotion contents through various inputs on the web including case studies, powerpoint presentations and journals. In this step, students grouped voluntarily according to their interests. Online critical thinking tests were also given as a pretest.

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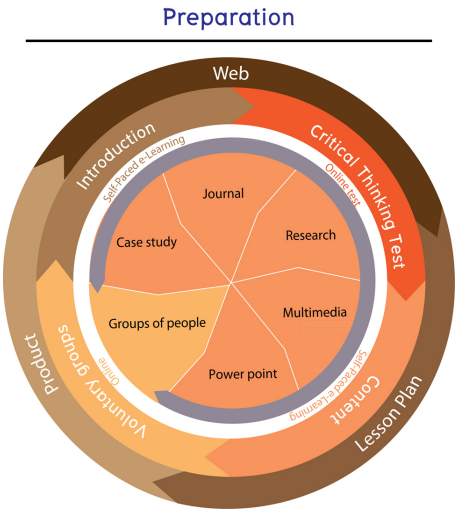


Figure 2: Step 1 Preparation

Step 2 Proposing issues (as shown in Figure 3)

Learners proposed issues there were interested with regard to health promotion contents provided on the web which were; health and health care, nutrition, exercise, stress management, environmental health and quality of life. In this stage, students learned to understand, identify and analyze the problems.

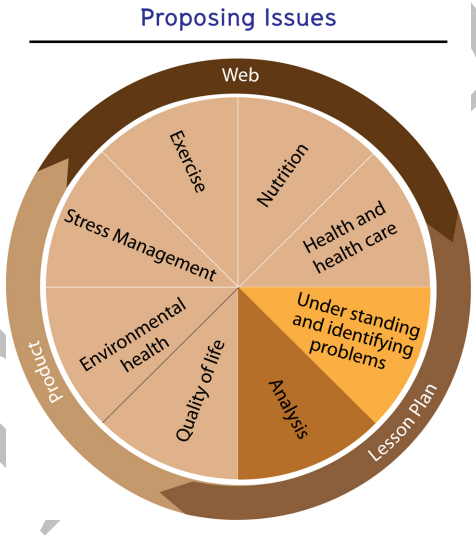


Figure 3: Step 2 Proposing Issues

Step 3 Searching (as shown in Figure 4)

Students searched for related information and knowledge through various sources including ones that provided by the teacher. The social media website allowed on-going discussion, observation and participation of both

learners and the researcher. Students were encouraged to evaluate information gathering from different sources. Two of the six critical thinking skills, inference and evaluation, were developed in this step.

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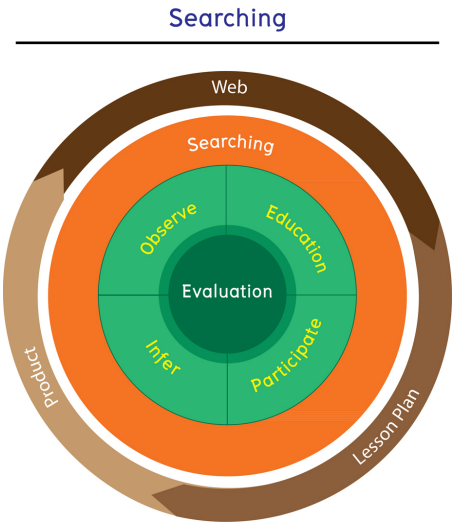


Figure 4: Step 3 Searching

Step 4 Data collection (as shown in Figure 5)

Following the third step, learners brainstormed and asked questions online. Various techniques were used in data collection including deductive inference, observation and interpretation. Evaluation reliability of data sources was also conducted in data collection step. Inference and interpretation skills were the main focuses in this step.

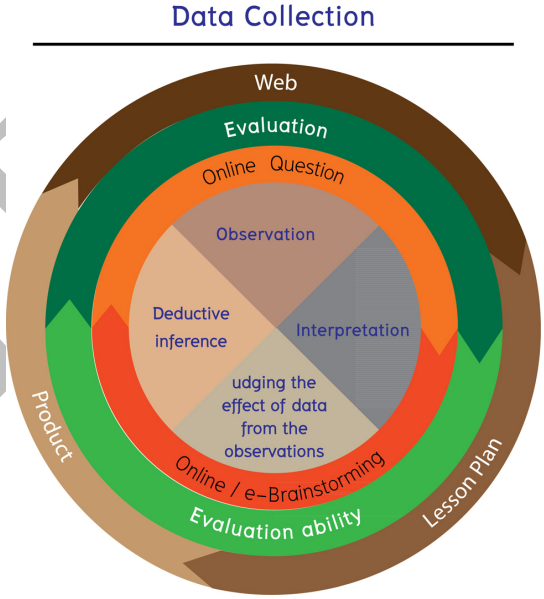


Figure 5: Step 4 Data Collection

Step 5 Diagnosis (as shown in Figure 6)

Learners used their abilities to find the reasons. Examples from online resources were used to draw conclusion. Inductive inference skill was developed in this step.

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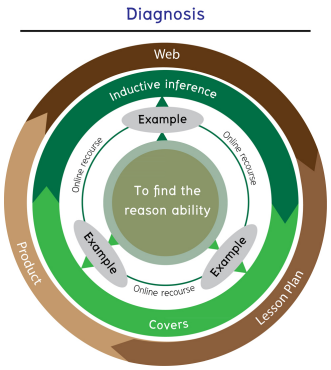


Figure 6: Step 5 Diagnosis

Step 6 Discussion (as shown in Figure 7)

Students discussed in groups to plan for group work via Web Board and Chat Rooms through online brainstorming and online questioning. In this step, learners learned to write and test hypothesis to find reasonable answers or solutions.

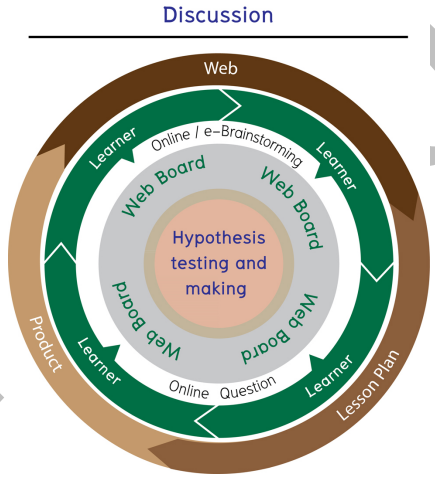


Figure 7: Step 6 Discussion

Step 7 Choosing best choice

From several health related issues proposed by learners, one issue was selected to further study in more detail. Brainstorming techniques and online discussion were used to choose one best option. The critical skill developed in this step was self-regulation.

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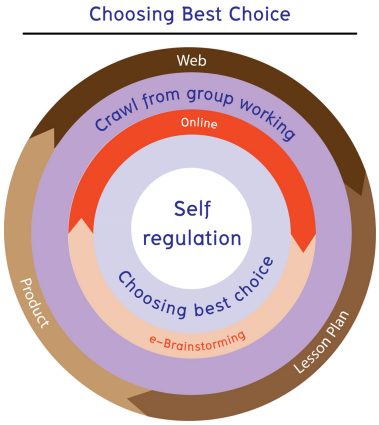


Figure 8: Step 7 Choosing Best Choice

Step 8 Implementation (as shown in Figure 9)

Students created an outcome of the web-based instruction based on constructionism in the forms of a mind map or a project. The teacher encouraged knowledge exchange among students through web board and web blogs. Online discussion and brainstorming still used in this step

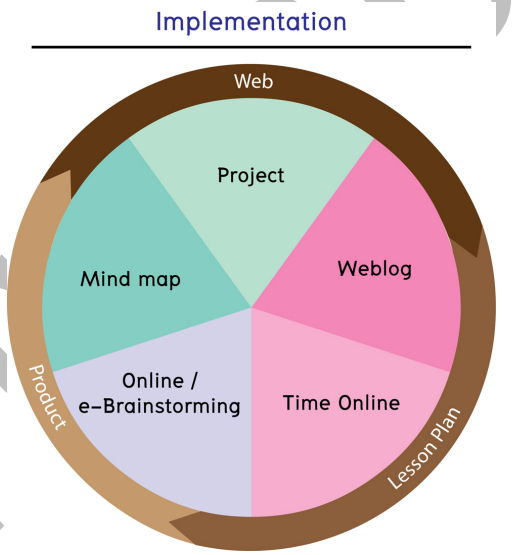


Figure 9: Step 8 Implementation

Step 9 Presentation (as shown in Figure 10)

Each group presented their outcomes (projects, mind maps) via the web. Every group of learners were encouraged to participate through online questioning and brainstorming at all time of the study.

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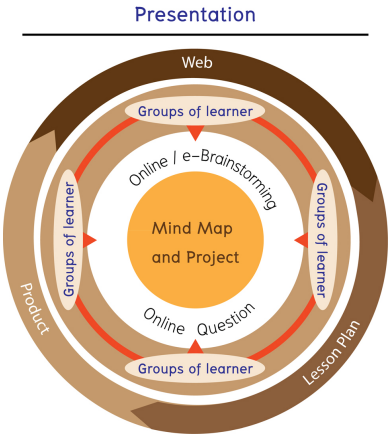


Figure 10: Step 9 Presentation

Step 10 Evaluation (as shown in Figure 11)

Learners were evaluated in three aspects, which were process, progress and learning outcomes. Learning process was assessed through a number of activities comprising of web board discussion, answering questions at the end of each lesson, assignment completion, group presentation, and work edition/correction. Progress of six dimension of critical thinking of Ennis (1985) (interpretation, analysis, evaluation, inference, explanation, and self-regulation) as well as learning outcomes/products gaining from learning through personal and community health promotion website (mind maps, projects) were measured in this last step.

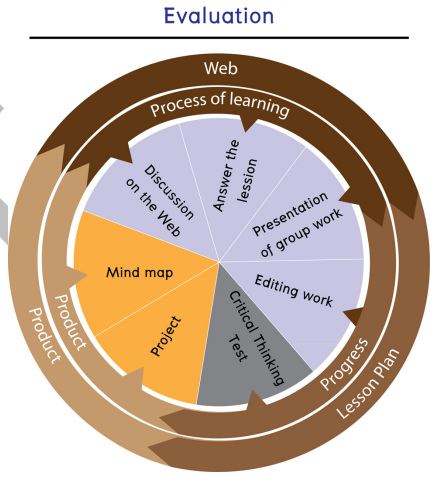


Figure 11: Step 10 Evaluation

II. Critical thinking test results

Table 1 compares critical thinking test results before and after using a health promotion learning website. An average pre-test score was 20.79 while an average post-test score was 42.19. The total

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score was 52 points. Therefore, it can be concluded that critical thinking of the students after using the web-based instructions was higher than before learning at .05 level of significance.

Table 1: Critical Think Test Result

CT test	n	$\overline{X}$	S.D.	t	p
Pre-test	21	20.79	4.39	12.58	0.00
Post-test	21	42.19	7.15		

III. Student satisfaction

Student satisfaction with the web-based instructions showed that the students using the new type of learning method had a satisfaction score of $\overline{X} = 4.89$. The study showed that after using health promotion learning website, students gained higher critical thinking scores than before using health promotion learning website at .01 significant level. Students expressed the highest level of satisfaction with the website.

Conclusions and recommendations

It can be concluded that the 10 Step CT model can help developing critical thinking skills in Kasetsart undergraduate students and student satisfaction with the website was at the highest level. In this study, an educational social media website was used as a platform. The comparison of using this model on different platform such as Edmodo and Moodle can further research to explore the preference of the learners and better results in critical thinking development and users satisfaction.

Acknowledgement
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A Practical Guideline To Quantifying Qualitative Analyses Of Design Cognition

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Abstract
Over the years, the empirical design research methodology has continuously changed and structured. It's become more popular in investigating a typical design cognitive among industrial design researchers. Whereas, verbal protocol analysis (VPA) with artificial settings and think-aloud instruction was used as design cognition methodology. In principle, the method adapted is a type of qualitative data where the challenge with this VPA is about the standard of recording verbalizations strategy. In which, there is no special instruction to test hypotheses about product design cognition in the real world. To deal with these problems, it is recommended to develop a research guideline on the observation set up procedure. These promises to improve the ecological validity over the empirical design research methodology include with the possible sampling required. The main goal of the analyses is to formulate a methodology of analyzing qualitative data in an objective way.

Introduction

Recent years shows design research has become increasingly important. The term "design research" is the practice of developing information for a particular design project (Sato, 2009). A kind of research typically includes information between designer, user and artifact. It is an important design investigation which can indicates the practice of structuring the knowledge contribution, which can develop design principles, theories, methodology, even new instrument for future practical applications. Tomiyama (2009) define, design research can be group in two perspectives. (1) Fundamental research, which aims at scientific understanding of design process (process-oriented analysis), activities, knowledge and object; and (2) Application-oriented research that can be used, better design support and better design results (content-oriented analysis). The new cognitive approach to human thinking sees human beings as much more adaptable and genuinely intelligent organism than the early behaviorist approach (Lawson, 2006).

Research and design probably can define as independent term and stand-alone means by it self. Though, Frayling (1993) indicate three different value of terminology if these words

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combine as; Research "into" Design (Design History), Research "for" Design (Industry Method) and Research "through" Design (Through Practice) as drawn in Fig. 1 (on Frayling 1993). This three definition defined based on the investigation of six PhD work as examples. Using the same domain of research design, Frayling identify the main issue discussed among the researchers is about "How was the research conducted?" The understanding of research design from the same examples then been cleared by Cross (1999) when he highlighted, those researcher (See Fig. 1 on Cross, 1999) is also explore on "What was the focus of the investigation?" Here, the typical discussion on design cognition has a necessary involvement with other parties between people, process or product. The detail discussion between "Research Conducted versus Research Investigation" by Frayling and Cross derive to a major changes of empirical design research nowadays.

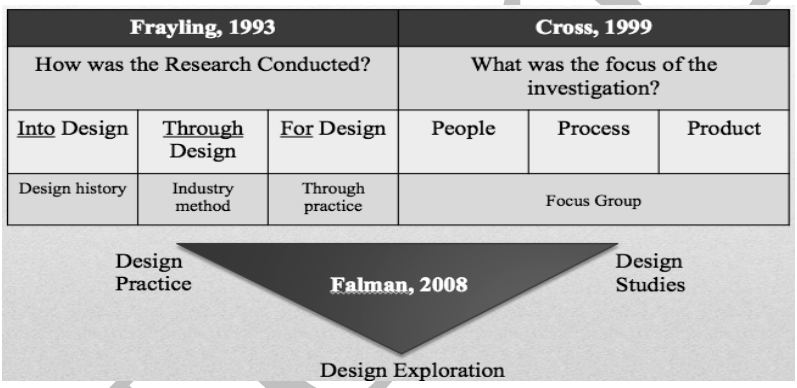


Fig. 1. Discussion between Research Conducted and Research Investigation by Frayling1993, Cross1999,
influenced Falman's Model (2008).

We agree that a triangulation theory by Frayling and Cross has overcome to the introductory of a model emphasis on interaction design as about presenting possible future of design research (Falman, 2008). He believed, the organisation of the model able to enlarge the overview and expand the design research discussion, in which they supported by the three vital interfaces as central to interaction design research. The fragmentation of Falman's model can be summarised as specified in Table 1.

Table 1: Three vital interfaces as central to interaction design research.

	Vital Interface	The activity	Means
1	Interface towards industry	Design practice	This interface recognizes and acknowledges long-term collaboration
2	Interface towards academia	Design studies	Building an academic & intellectuals tradition within the organization
3	Interface towards society at large	Design exploration	Materializing or "*thingifying*" one's ideas, sketches and thought experiment

The design cognition of industrial designer

Anwar, Abidin and Hassan (2015) have identified seven patterns of formgiving design in both models of Adreason and Pahl product development process. It's reflected to interaction between designer-artefact-user (DAU) in design activities that reframe by Anwar et. al (2014). Based on the findings, the principle-solution in design adept by designers is initiate to several phases starting with *the needs* (related to design theory); *problem solving* (related to product architecture); *principle of design* (related to aesthetics demand); *product design specification* (related to material requirements); *manufacturing design* (related to production and technical solving); and ended to the *continues improvements* (related to DAU feedbacks). Here, we circumscribe this design cognition as Formgiving Design Principle-Solution (FDPS). The intention of FDPS is to visibly the important and different arrangement between DAU interactions during each phase of design development (See Fig. 2). For example on *The Need* phase, industrial designer has placed the *users* as on top of discussion, mainly given the top priority of FDPS, followed by the role of *designer* to initiate the FDPS and conclude the FDPS by testing the design application on the *artefacts*. The DAU System then re-arrange as priority of principle-solution on the next phase of design development.

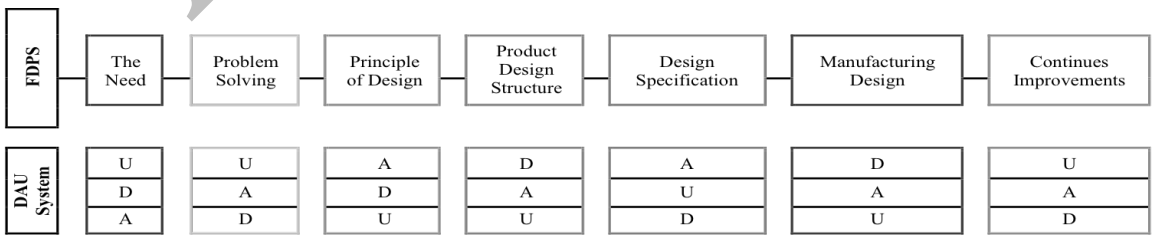


Fig. 2. Diagram of seven patterns during product development in conjunction to FDPS and

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Towards product understanding, Abidin (2012) revealed about the second mode of comprehension is about making 'sense of things', where the products are "understandable to their users" (Krippendorf & Butter, 1984). The understanding of characteristic such as level of product quality and its nature; its operation description; properties expression; and insist the specific types of action and non-action; can informs and advised about itself through the comprehension. On the other views, the comprehension seems to be as references in the product point of view, specifying the meaning associated to nature, behavior, properties and fundamental of physical characteristics of product. Semiotically, indexical and symbolical signs create references for product comprehension.



Fig. 3. Framework of perceptual product experience (PPE), with core modes (centre) and the two dimensions of presentation (left) and representation (right) with sub modes (Warell, 2008).

In product design, especially in the interpretation of visual appearance, concepts such as form and shape are used when describing the form of object. Traditional design methodology recommends that design should be moved from existing problem descriptions, which is the problem, described depends on an individual perspective of a person (See Fig. 3). And abstract solution model, which is abstract functional representation and concrete form representation – to open up new solution space (Blessing and Chakrabarti, 2009). The abstract models are then developed towards concrete solutions via "functional principles" and "principle structures".

The need of protocol analysis in design thought

Works on research design (most of which focus on quantitative research) have understood "design" in one of two ways (Maxwell, 2009). One model takes designs to be fixed where standard arrangements of research conditions and methods with their own rationality. The other models present design as a logical progression of phases, derive from the problem formulation to the generation of conclusions. However, he against the agreement of these models satisfactorily can represent neither logic nor process of qualitative research. As refine by Yin (1994), every type of empirical research has an implicit, if not explicit, research design. Design process can be seen to encompass psychological activities. As categorization of design research (Fig. 1) by Cross's (1999) mainly concerned with the three categories of (1) the study of how people design (design epistemology); (2) the study of design methods, techniques, and processes (design praxeology); and (3) the study of the artifacts that come out of design processes (design phenomenology). Friedman (2000) suggests four areas that a progressive design research program needs to address; (1) the philosophy and theory of design, (2) research methods and research practices, (3) design education, and (4) design practice. Therefore, in order to analyses new design cognition for industrial designer, the combination between design theory, design knowledge and design experience should bring together in practice for the empirical study. Practice alone cannot create a new knowledge. The knowledge creation cycle generates new knowledge through theorizing and reflection both (Friedman, 2000).

The direct evidence of design investigation has managed to come as generally known as *think-aloud protocol* approach. Protocol Analysis is an empirical with observational research method and usually sets in a custom arrangement of recording designer's behavior. Include with the verbalization, sketching and video-audio recording capture by cameras (Akin, 1984). Since the availability of video recording added in thinking-aloud protocol analyses by Newel and Simon (1972) in their logical problem solving, the non-verbal behavior of subject has extend alongside with their verbal report. It is aims to elicit the inner thought or cognitive processes that illuminate what's going on in a person's head during the performance of task (Patton, 2002). From a generous report, the verbal protocol analysis (VPA) has played a big role in any empirical design research. When VPA was introduced to design research, the range of study was revised and expended to investigate group design activities piloted in

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small teams. It designed to set a designer to work under controlled situation and asking the designer to 'think-aloud' while designing. It is a method to bringing out the explicit and implicit illustration in design activity and exposes the cognitive ability of designers (Abidin, Christoforidou & Liem , 2009). There are

two main reasons strictly treat by Lawson (2004) in underlying the breakdown of design protocol that he defined as temporal and rational.

Since the beginning of empirical design studies (Cross, Christian & Dorst, 1996), theatrical designers solving realistic but artificial design task set by the experimenter, and performed within a specific time limit. In earlier, it was reported by Rianne (1998) that team member could contribute specialist knowledge necessary fir the growing complexity of products. It is then clearly found by McDonnell, Lloyd and Valkenburg (2004), the process of story construction presented rich opportunities for making sense of both design education and design

practice. Torlind et. al (2009) then come and suggested a laboratory-based which came as experimental studies typically not using practitioners, in a condition of custom environment. Until Cash (2012) has discovered the major issue in empirical design research is the complexity of design research studies and the difficulty of disentangled the relationship connection. This short description confirm protocol analysis or think-aloud protocol approach can help to establish the form of design cognition that can offer a great potential for further development. A team or individual design process can be interpreted in order to illustrate the use of analysis tools. Referring to argumentative before, it's proved as convincing tools to quantify the qualitative measure of result especially for creative designer. The 'wake up' calls of empirical design studies through protocol analysis have derived to a big potential that can change the direction of art and design research even social sciences.

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Procedure of this paper

In this paper, we extend the VPA theoretical framework by Abidin et al. (2009) in conjunction with laboratory setting. The VPA and artificial environment was adjusted to meet the guideline of analyses design cognition among creative designer. In order to meet the need of analyzing design activity, we bring together the theoretically and practically experienced

VPA as artificial environment guideline. It would be interesting to observe the embedded design thought such product design, machine design and communication studies. The project execution begins with individual commissioned to design an ablution tub to be present in a situation of ablution space at mosque. There is a person possibly in a same category or group who's stimulated with different requirement. Respondent can select and decide the class of design features that will satisfy the needs of ablution tub design. This suggested protocol is designed to investigate design thought of respondents during formulating a new design structures for ablution from existing knowledge (Abidin, Bjelland & Øritsland, 2008). It is also empirically explore how designer indicate any elements or components for specific design situation, include the mystery reason while they integrates the value of form into a value system that control behavior. The VPA develop tries to understand design cognition and in particular a kind of knowledge gain from learning (Chi, 1997).

Proposed empirical design protocol

Delft protocol workshop argued that, "… of all empirical, observation research methods for the analysis of design activity, protocol analysis is the one that has received the most use and attention in recent years. It has become regarded as the most likely method (perhaps the only method) to bring out into the open somewhat mysterious cognitive abilities of designer" (Cross, Christiaans & Dorst, 1996). This method open up a huge potential in developing new design research methodology (DRM) driven by Blessing and Chakrabarti (1996), to be absorb in our design protocol analysis. Even DRM give guidance on a high-level of methodology, they still did not discuss the specific method. Due to the absence of finding in appropriate method for creative design practice (Anwar, 2015), we bring a new strategy to close the gap. Furthermore allow for expand a research method in quantifying subjective manner especially in art and design practice.

Proposed methodology separate by three segments following the suggestion by Cash (2012), and issues on the complexity of design research studies, including the difficulty of disentangled the relationship connection, we defined; there is a need to adapt the model into three different strategies that can bring a wider pattern of observation strategy. The purpose of adapting these strategies is to addresses the unruly design method portrayed on figure 2. Fill in the important characteristics of existing work, its allow us reframe DRM theory into art and

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design practices. It is an important method for the empirical study as a primary element in understanding the creative designers think. At the same time, the integration strategies allow us to retaining the standardization. The three major strategies with sub-strategy are illustrated in figure 4. The next section will discuss on the outline of; (1) Capture Strategy; (2) Coding Strategy and; (3) Meta-Analysis Strategy.

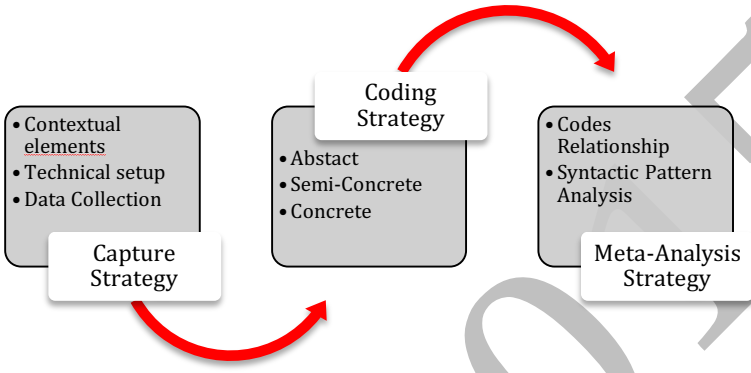


Fig. 4. Basic method diagram for design protocol analysis

i. Capture strategy

The main reason of defining Capture Strategy into the sub-strategies is validate the methodology designed is relevance and able to measure the characterising in detail. The contextual elements allow us to control the participant's population and comparative with other research before. For the technical setup, we developed based on the suggestion by Abidin et al. (2008) and Anwar et al. (2015). The capture technology chose for this approach is closed-circuit television (CCTV) and viewpoint is arrange into four views; (1) front view; (2) top view; (3) side view and; (4) overhead view, to record the entire workspace in artificial environment (designed as similar with designer's working area). Figure 5 is the development of capturing strategy that can allow the qualitative data be quantified with the inclusion of direct-evidence data. The aptitude of this strategically developed protocol analysis is to offer the designer's comfort's atmosphere while practicing the design activity. In front of designer workspace, influence panel provided aimed at two purposes in this empirical studies. At first, become as idea inspiration or brainstorming input. On the same time, it is an order to study the most influenced information for designer while constructing their designs. With the complete setup of necessary context covered, the data collection strategy is limit to control the

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interaction between researcher and subjects. The CCTV is fully automated complete with data storage system. The reason is to allow the subject/respondent practice on they own practices.

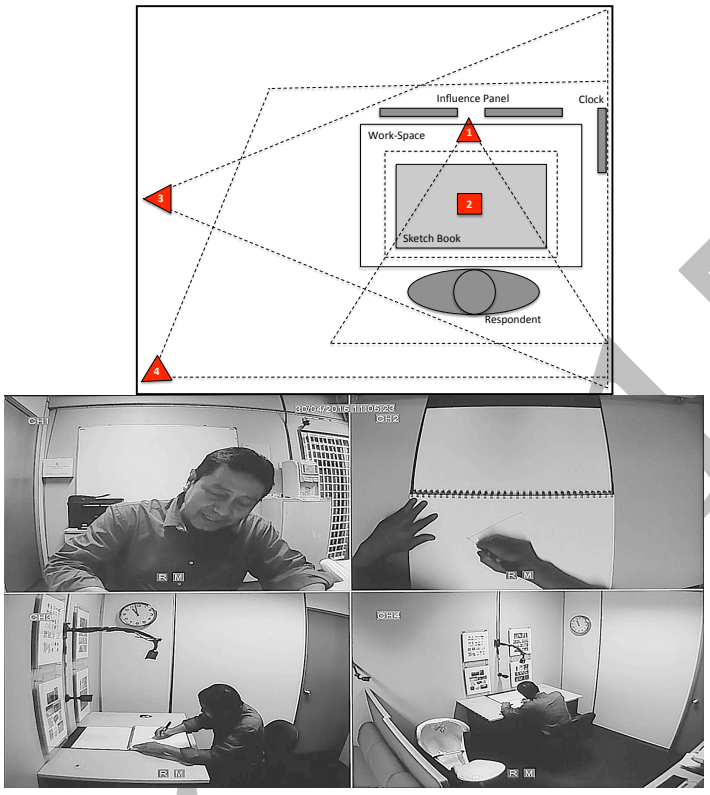


Fig. 5. Controlled experimental environment setup. Complete with four cameras (views), influence panel (optional four), clock (time recording), work-space (designer's working area) and sketch book (design activity).

ii. Coding strategy

Many researchers agree with Chi (1997) about the definition of verbal analysis as a kind of methodology for quantifying the subjective, or qualitative coding of the contents of verbal utterances. However, he mentioned that quantification of qualitative coding is not the same as direct counting method whereby researcher picks out aspects of the qualitative data that can be quantified directly. In developing the codes, Cash (2012) suggested the important of multilevel coding strategy to align with the analysis process. Here, we bring an example of coding strategy, see [Table 2] that consider as important key element in characterising a design pattern among creative designer.

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Table 2: An example of Codes Level, Group and Option

Code's Level	Group	No	Code	Code Option
Context	Situation	1	Individual Designer	0 - Student, 1 - Novice, 2 - Intermediate, 3 - Senior, 4 - Expert
	Subject	2	Design Process	0 - The Need, 1 - Prob. Solving, 2 - Principle of Design, 3 - Prod. Desg. Structure, 4 - Desg. Spec, 5 - Manufacturing Desg, 6 - Cont. Improvement
		3	Focus of Activities	0 - Symbol & Sign, 1 - Building & Architecture, 2 - Object & Artifacts, 3 - Culture & heritage

This coding sample consisted of the code on assessing the design activity during "Abstract, Semi-Concrete, Concrete" design level. It does include the short-term memory as a controlled time frame of design thought. Known as Subtraction Method (Sternberg, 1996), that use of task and instructions that left the subjects choice of "processing strategy" relatively uncontrolled. Its allow individual differences are overcome by examining the pattern of the linear function relating response times.

iii. Meta-analysis strategy

The Himmelfarb Health Sciences Library (2011) discovered that meta-analysis (subset of systematic reviews) is a method for systematically combining appropriate qualitative and quantitative study data taken from several selected studies to develop a single conclusion that has greater statistical power. This conclusion is statistically stronger than the analysis of any single study, due to increased numbers of subjects, greater diversity among subjects, or accumulated effects and results. Garg, Hackam, and Tonelli, (2008) explained, by combining the samples of the individual studies, the size of the "overall sample" is increased, enhancing the statistical power of the analysis and reducing the size of the confidence interval for the point estimate of the effect. Provided similar, well-conducted, randomised, controlled trials has been considered one of the highest levels of evidence.

For these reasons, taking meta-analysis as important strategy to be conducted, any methodological limitation including small sample size, could give a solution that may identify

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the gaps exist in the available literature. Angrosino and Rosenberg (2013) rationalise the mechanics of observation-based research nowadays were revitalised by the introduction of audiotape recorders, movie cameras, and later video recorders. It shows that any observational-based research is formed by the situational characteristic and the need of the owner (researcher) in conjunction with their potential collaborators.

We recommend, the "observation on observation" in analyses form syntactic can finalise all gap in research question existed in any design cognition and behavioural study. Its theoretically can confirm of form entity relations reveals a consistent treatment of a design format and an evident aesthetic organ structure (Warell, 2001). The selection of ten other respondent require in this strategy to guarantee the consistency of the data. The selection of the respondents is analytically defined to ensure the same sensitivity and closely resembling each other (Patton, 2002).

Conclusions and future research guideline of ivdpa

We have review informally several design research on the role of protocol analysis as practical method to quantify a qualitative data in empirical design study. Empirical design research offer highly evidence-based data with a variety of record approaches. It serves as explanation as why VPA has become popular in the engineering

discipline commonly to quantify data. However, a new gap will occur in each research finding and discussion to offer a possibility of future research. In order to analyses design cognition among creative designer, we expand three major strategies (Capture Strategy, Coding Strategy and, Meta-Analysis Strategy) from the existing model. Working to specifying the research design that can refine the casual relationship between qualitative and quantitative data. Additionally, rethink the research design theory led to the discovery of three kinds of situation represented by physical, artifact and information. Awarding a practical guideline as tools to analyses design cognition.

As VPA is recognize as suitable method to evaluate design activity, but not been used *by* design researcher, *for* design or *through* design for a long time (Abidin et al., 2009). To overcome this matters as potentially used for future design research, we suggest *in vitro*

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studies to be conducted which mainly a study perform in a laboratory or controlled experimental environment. We restructure all experience in protocol literature, and develop new model and strategy to expand the significance study as a new method and tools for art and design research. Thus, allow any researcher to study different level of career development (student to expert) thinking. However, it does require a strong methodological foundation and specify the crucial tools in order to judge method appropriateness for each case. Such a theory might suggest that activities in design such as sketching and understanding a brief would be difficult to verbalize and there is indeed evidence to support this view (Daley, 1982). In addition, it is difficult to isolate an episode of purely "understanding the brief" where Cross et al. (1996) found the subject (respondent), stop talking while thinking seem to be point of value where decisions are made.

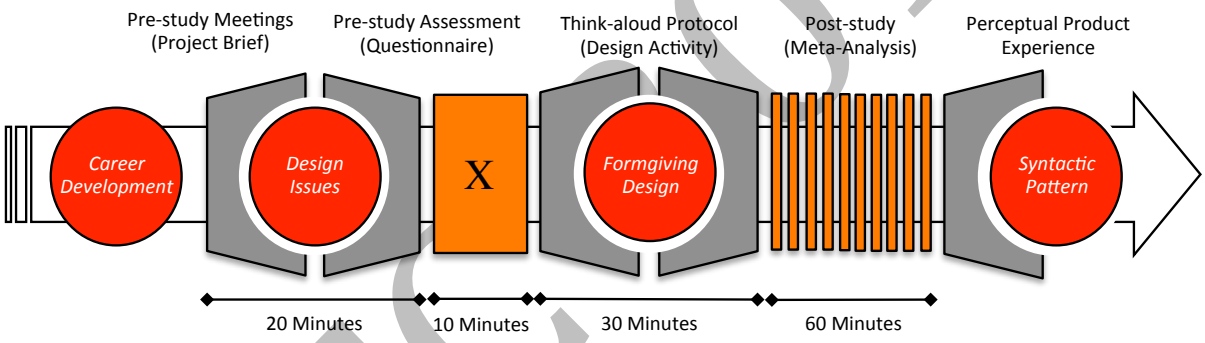


Fig. 6. Fragmentations of in vitro Design Protocol Analysis begin from pre-study meetings, pre-study assessment, think-aloud protocol, post-study and perceptual product experience.

Our experimental methodology (Abidn et al. 2009, Anwar et al. 2015) is slightly differs with other practices in engineering field. The idea is separates the *in vitro design protocol analysis* (IVDPA) into five phases of integral part (see figure 6) to effectively increase statistical and making generalizations of its validity. As usual, a number of designers (up to five) varying in experience us as subject (Lloyd, Lawson & Scott, 1996). In our methodology, industrial designer from a same background (product) classified into five different groups based on their career development (Student, Novice, Intermediate, Senior, Expert). At first phase (pre-study meeting), the designers explain in-depth about the scope of task that involve in this experiment. At this stage, subjects briefly explain about the design issues related to the experiment requirements. The problem provides is commits to a particular solution form. In

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order to control and shaping the designer's think, we develop the questionnaires (pre-study assessment) that soon be signify in the IVDPA. Here, we can clarify type mode of behavior among designer from different level of career development. The subjects need to respond to the questionnaires in 20 minutes. This two strategy is a 'tools' to scope designer's mind closely into the design issues and it's (X) often report as a 'moment of inspiration or a 'time when everything fitted together'. Its relate strongly to considerations of how designer learn to design and study the design ability development in individuals (Cross, 2006).

Think-aloud protocol by IVDPA that we suggest in Section 5 will put in practice just after 10 minutes of pre-study assessment. The idea of un-verbalized design thinking (stages of processing) is still retain to overcome the issues highlighted before. Here, the strategy of short-term thought processes (Lloyd et al., 1996) can explore the

links between problem and solution in formgiving design. Based on their recommendation, we imply the time frame in thirty minutes (ten minutes each) for every design level (abstract, semi-concrete and concrete). As Dorst (1996) remind on the view of design which known as 'creative analysis', become almost mystical process that could lead to such assumption. So as to quantify the data gain from IVDPA, the inclusive of post-study (meta-

analysis) purposely to provide conceivable valuation that can be tested in subsequent studies. This phase demanding ten respondents that purposely select to perform the observation on observation with aimed for meta-analysis results. This phase is the most important stages in turning the general and non-specific aspect of form or design manner into an objective approach. The quantitative data suggest by Warell (2001) form syntactic modeling able to relate the specific form elements of the visual form to product functionality. By realizing the form entities, the important constitution of the physical form of a product as conceptual element clearly can describe. This 'tools' purposely use as subject matter and indicators for those ten respondents when performing the meta-analysis strategies.

The main contribution of this guideline is the integration model and concept of research mainly use by design science to be adept into the field of art and design research. The contributions of engineering design theoretically prove the qualitative data with a systematic analysis, able to be quantified. Thereby, the implementation of IVDPA as basic design methodology explains and relates all aspect of the design cognition (technical or aesthetic).

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Academic Progress Depending On The Skills And Qualities Of Learning In Students Of A Business School

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Abstract
This research was to establish the relationship between qualities of learning; learning skills and academic performance in undergraduate students.
310 undergraduates participated in this research of which 72% are female and 28% male.
All responded Scale Learning Strategies of Roman and Gallego (1994) and Questionnaire Learning Styles of Honey-Alonso (Alonso, Gallego and Honey, 1995), and the management system learning was used to establish the academic performance, from the accumulated average of each participant.
The results indicate that there is no single way of preferred learning, as most participants rated high in two or more attributes. As for learning skills it was identified that 42.6% use coding strategies. In addition, no significant correlation between the variables analyzed was found.
This information demonstrates it is necessary to teach techniques of study to the students, since it seems to be the best route to certify that his learning is the most successful.

Keywords. Learning styles, learning strategies, academic performance, higher education

Introduction

The growing interest in regards to the procedures and skills of learning is derived from studies of cognitive styles carried out in recent years, authors such as; Lopez and Ballesteros (2003); Troiano, Breitman, and Gete-Alonso, (2004); Belt (2006); Escalante, Linzaga and Escalante (2006); Fortoul, Varela, Avila, Lopez and grandson (2006); Barros (2007); Madrona et to the. (2007) and Herrera (2009) have conducted research that attempt to describe both learning styles and strategies that students from different university programs used to regulate their learning processes. Also, they have formulated hypotheses against the relationship that these variables have, the academic performance, the processes of teaching and learning that are used at the University level.

The results obtained by these researchers indicate that the predominant style in college students is the reflective. Furthermore, they found that learning styles where defined by the program in which the students were enrolled in, as well as the area of expertise in which they were registered. This could possibly be related to the contents, methodologies, information and specific requirements of each career.

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The above findings implies that the academic performance of undergraduate students, not only depends on the attentional and memory ability of students to retain and recall information, but also seem to require skills and processes involved in their analysis, transformation and application. On this last point, it is necessary for the student to have a quality of learning and with specific learning abilities to learn, favoring a better cognitive performance. It is worth highlighting that the learning conditions are likely to improve and when students are taught according to their own style of learning, they learn more effectively. This situation, can ensure high quality teaching and learning processes.

Taking into account that human beings to learn, require different cognitive processes, in the present study the relevance of two of these processes is exposed to ensure academic achievement. These are: the learning style and learning strategies. We will, describe and explain each of the variables tested in this work.

Conditions For Learning To Take Place

Studying the ways in which people perceive, analyze and structure information to learn, includes multiple aspects that can contribute to the understanding of learning processes in humans. While traditional education was considered a particular form of appropriating reality and teaching, at present, cognitive psychology has contributed new knowledge to ensure that, learning processes are successful. In particular, they propose two key concepts for this: styles and learning strategies.

"Learning styles are the cognitive, affective and physiological traits that serve as relatively stable indicators, how students perceive interactions and respond to their learning environments" ["Learning styles are the cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive and respond to their interactions learning environments" (Keefe cited in Alonso y Gallego, 1994, p. 104)]. These traits are evident in the way the subjects organized and outlined their interpretation and its relationships with the contents and information. They are also involved with emotional traits, motivations and expectations that influence learning and physiological traits associated with the biotype and the Biorhythm of the student.

Whenever a student is exposed to a learning task their learning style is revealed, because it defines the way they focus on new and difficult information, how it is processed and how it is saved (Dunn, Dunny Price, 1985); learning style involves different cognitive processes that unfold so that the apprentice can perform tasks that first needs to be learned.

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In this regard, it is important to consider that learning styles can promote the processes of acquisition, interpretation and analysis of the information. Because it allows the trainee to approach the contents to be assimilated in different ways, in addition to reorienting their actions towards effective mechanisms for processing information. Learning styles characteristics were described by Revilla (1998), stressing that they are relatively stable, they can be modified according to the situations to which a person is exposed, and serve as a means to facilitate their learning.

Learning styles are classified in accordance with the individual preferences of access to knowledge. One of the best-known classifications is that offered by the Honey Alonso Learning styles questionnaire (Chaea; Alonso, Gallego y Honey, 1995), which defines the following styles:

- Active learning style: based on direct experience and is characterized by being animator, improviser, discoverer, risky and spontaneous.
- Reflective learning style: focused on the observation and collection of data. This style of learning is characterized by being weighted, conscientious, receptive, analytical and patient.
- Theoretical learning style: based on the abstract conceptualization and formation of conclusions, this style of learning is methodical, logical, objective, critical, structured and planned.
- Pragmatic style of learning: focused on active experimentation and search for practical applications. This style of learning is characterized for being an experimenter, direct, realistic and technical.

Skills Or Learning Skills

Cognitive psychology posits the existence of different cognitive processes which allow the processing of the information accessed by a person, such as the processes of acquisition, encoding, storage and retrieval of data. In addition to these processes, the cognitive theories establishes that to obtain optimal performance of the cognitive system it is necessary for other metacognitive processes.

(See figure 1). Figure 1. Strategies activated in the information process. Taken from Román y Gallego (1994).

From a constructivist definition of learning, it is possible to conceptualize it as a mental operation that involves a series of coordinated cognitive processes that unfold in the

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individual before the execution of a task or exposure of a problem that must be solved. This, is the aim of the individual who is facing the situation through the use of specific learning strategies that will facilitate the process (Ausubel, Novak y Henesian, 1993; Flavell, 1984 y Bandura, 1982; Gagné, 1987). Camarero, Buey y Herrero (2000) defined learning strategies as purposeful activities that are reflected in the four major phases of information processing. This vision, operationalized in The Learning Strategies (ACRA) by Román and Gallego (1994), based on four learning stages experienced when learning:

1. Acquisition Stage.

At this stage the cognitive care process, is essential because it is responsible for selecting, transforming and transporting information from the environment to the sensory register (Román y Gallego, 1994). This phase includes: (a) attentional strategies, explores the information and fragments depending on the contents of previous knowledge; and (b) strategies of repetition, which have the function to facilitate the transmission of information to the long-term memory, simultaneously using different receptors such as vision, hearing, taste and motor function.

2. Encoding of information Stage.

Facilitates the development and organization of information linking it and giving meanings to generate new mental models. This stage contains strategies of development and organization of new information.

3. Information retrieval Stage.

Responsible for deploying memory search strategies (searches for encodings and indications), strategies for generation of responses (planning and preparation of the written response).

4. Support Stage.

Taking into account that information processing occurs simultaneously with other processes of metacognitive and cognitive which can strengthen, neutralize or impede cognitive functioning, metacognitive strategies such as self-awareness and self-management are therefore activated at this stage, affective strategies (auto instructions, self-control and distracting), social (to regulate social interactions) and motivational (to regulate the learning from the intrinsic motivation extrinsic, and exhaust the person learning experiences).

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Academic Performance

Currently, academic achievement, as a theoretical construct, is regarded as the product of a school process; your benchmark assessment assumes the achievement or not of some learning objectives. Bahamon (2010) shows that the academic achievement can be understood as the result, which should be, obtained by the student with respect to the goals set out by an academic institution.

Objective assessments are those that investigate the learning of a person from the application of standardized tests, i.e. to offer scores to refer to the academic achievement of a student, according to the performance expected for a population in particular. Meanwhile, educational tests are those constructed by teachers within their work of teaching-learning, which can highlight the achievement of a student from a quantitative or qualitative, rating defined by the teacher.

Taking as a reference the above, this research was aimed to determine whether there is a relationship between the type of learning, learning skills and academic achievement of students of a Bachelor's degree from a business school.

The hypothesis of the study asserts the existence of a statistically significant correlation between types, skills learning and academic achievement of students participating in this work.

Method

This study is a non-experimental, quantitative transversal-correlational design (Hernández, Fernández y Baptista, 2006).

Participants

The sampling technique was by convenience (all students of the Faculty of second and third semester had the same opportunity to participate), in which all existing degree programs offered by the school were considered. Subsequently, the number of students per program that were to participate in the study was established, to have a representative sample using the formula *sh=n/N*. Of the total of 1963 students enrolled in the august to december 2013 semester, 310 students participated in the study, between the ages of 17 and 21 years old. From this total, 223 participants were female and 87 were male. Most of them, from families of middle socioeconomic stratum. Participants were part of four careers: (a) Information Technology, (b) Administration, (c) International Business, (d) Accounting.

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The only established requirement for inclusion was only students in their second and third semester could participate.

Instruments

Learning Strategies (ACRA; Román y Gallego, 1994).

Auto report instrument that permits quantitatively assessment of learning strategies that take place during the study activity in different phases of acquisition, encoding, retrieval and information support (Nisbet y Schucksmith cited in Román y Gallego, 1994). It consists of four separate subscales which evaluate the students use; of seven acquisition strategies, thirteen coding strategies, four strategies of information retrieval and nine strategies that support the processing. This scale has adequate psychometric properties. For example, the coefficients of reliability of the ACRA scale, are widely satisfactory for their different subscales. The acquisition subscale obtains a score of 0.77 Cronbach's alpha, 0.93 coding subscale, the subscale of recovery of 0.84 and the 0.85 support subscale (Barca, Peralbo, Marcos, Malmierca y Porto, 2009).

Honey-Alonso Questionnaire Learning Styles (Chaea; Alonso, Gallego y Honey, 1995). Self-reporting that can be applied individually or to groups, consists of 80 items scoring between 0 and 1. This instrument allows to evaluate four learning styles according to individual preference in access to knowledge, which were described above. These are: active, reflective, theoretical style, and pragmatic style of learning.

According to the results reported by Villardón and Yániz (2003) and Vivas (2002), the application of the Chaea in Spanish speaking population obtained indices of reliability suitable for each of the styles. The active style got an alpha of Cronbach of 0.62, the reflective of 0.72, 0.65 theoretician and the pragmatic of 0.58.

Academic performance. It was assessed via the academic performance reporting system offered by the University, on the cumulative average that each student has in the career being studied at the time of the measurement. The rule establishes that this average should be on a scale of 0 to 100, where scores below 70 are considered failing, scores between 70 and 89 are medium, while those equal or over 90 are considered high.

Procedure

The implementation of the instruments was carried out by selecting participants by convenience. A request was sent to the selected group of students via each of their teachers. From which, a visit was made with the participants to give them specific information on the

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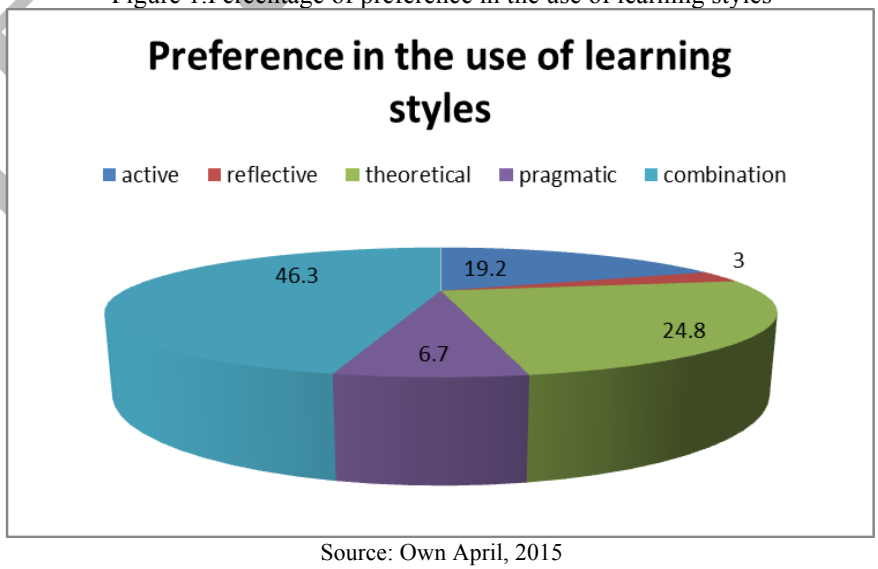
study, as well as the processes of application and citation. The instruments were applied to participants with prior signed informed consent. Administration of the scales was performed in a single session during scheduled class time, with five-minute rest periods between each instrument. Subsequently, the grading of the questionnaires answered by the participants and the processing of the data making use of statistical programme SPSS.21 was carried out. Descriptive statistics and inferential (coefficient of range of Rho Spearman, to define the relationship between the studied variables) were calculated.

Results

The age range of participants was between 17 and 21 years, range that matches the General characteristics of the undergraduate students.

In regards to the type of educational institution in which the participants attended for their post-secondary education, it was found that 244 of them said to have studied at an institution of a public nature. The average academic achievement of participants was 76, which shows that the majority of the participants were categorized as average. The achievement of men and women is within the same midrange, being the minimum cumulative average of 70 and the maximum average of 88. Preferences in the use of learning styles, according to the results obtained by the application of the Chaea, show that the majority of the participants do not make use of a style or type of learning. Thus, it is possible to identify combinations of different styles. In terms of pure styles which arose in the students, this study identified 24.8 per cent use the theoretical style, followed by the active style 19.2% (See figure 1).

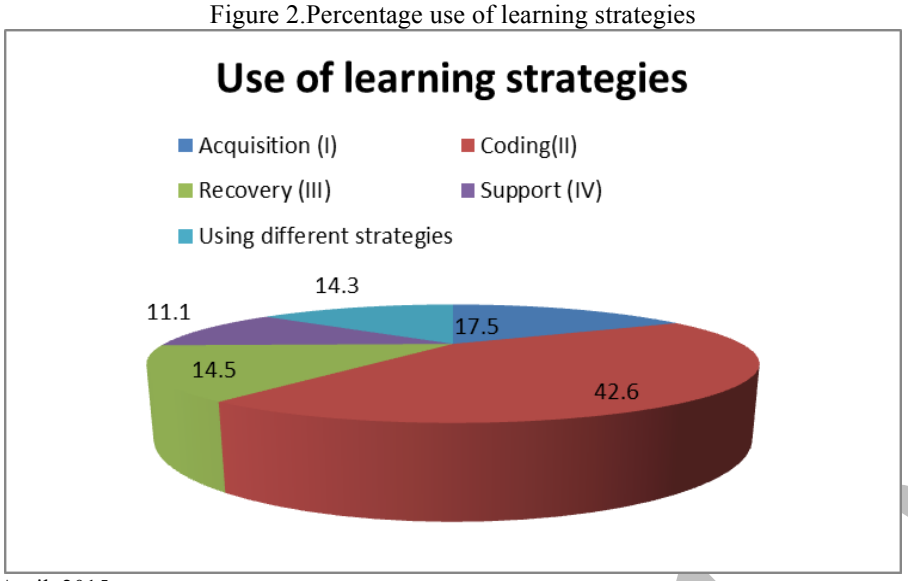
Figure 1.Percentage of preference in the use of learning styles



Source: Own April, 2015

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Figure 2.Percentage use of learning strategies



Source: Own April, 2015

About the use of learning strategies, participants registered significantly higher coding subscale, indicating it is common in the students to use skills that help them organize information that are taught at the university, seeking to make sense to new information (see Figure 2). Besides the specific scores, the participants show the use of two or more preferred strategies simultaneously.

However, the scale with the highest score in the ACRA scale coding was followed by acquisition, which has attentional processes to select and transform information coming from the sensory registers. The lowest scores were in the range of recovery, suggesting that students use to a lesser extent processes for deploying skills that facilitate the search for information in memory. The lowest score was presented on the use of support skills, participants indicating that fewer resources to deploy self-knowledge and cognitive, emotional, social and motivational self-learning

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sense to new information (see Figure 2). Besides the specific scores, the participants show the use of two or more preferred strategies simultaneously.

Table 1. Learning Skills for academic performance of the participants

	Acquisition strategies			Coding strategies			Recovery strategies			Support strategies		
Statistical	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Mean	48.3	53.4	54.4	50.3	64	70.4	41.7	53.3	58.3	28.3	48.0	57.4
S.E.	6.0	1.9	5.1	20.3	1.7	3.9	18.3	1.8	4.3	6.0	1.8	4.4
Median	45.0	60.0	60.0	30.0	70.0	80.0	60.0	55.0	60.0	25.0	50.0	65.0
S.D.	10.4	30.6	34.4	35.2	27.8	26.5	31.8	29.1	29.2	10.4	28.5	30.0
Minimum	40.0	1.0	1.0	30.0	1.0	10.0	5.0	1.0	5.0	20.0	1.0	2.0
Maximum	60.0	99.0	99.0	91.0	99.0	99.0	60.0	99.0	99.0	40.0	99.0	99.0

Source: Own April, 2015

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When analyzed together learning skills used by the participants and their academic performance, The study finds that students with high benefit aimed primarily used learning skills in the phase of recovery, which shows that students with averages between 80 to 100 tend to have better planning of study and exam preparation (see Table 1). For their part, students whose academic performance is in the middle range (60 to 79) have a predilection for using learning strategies the acquisition phase. In this case highlights the use of these strategies in charge of exploring the prior information and fragment it to relate to the content of previous knowledge. Meanwhile, Table 2 details the relationship between learning styles and academic achievement level of the students participating in this study

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The Analysis of learning styles, depending on the program that enrolled participants to highlight some particular evidence. For example, Information Technology students, often use reflective learning style; in Accounting, students use the pragmatic learning style.

Table 2. Quality of learning vs. academic performance.

	Active			Reflexive			Theoretical			Pragmatic		
Statistics	low	Med	high	low	Med	high	low	Med	high	low	Med	high
Mean	14.7	13.2	12.9	14.7	15.0	15.5	13.3	14.4	14.7	11.0	14.0	14.1
S.E.	1.3	0.2	0.5	0.3	0.2	0.4	1.3	0.2	0.4	3.1	0.2	0.4
Median	16.0	13.0	13.0	15.0	15.0	16.0	12.0	15.0	15.0	13.0	14.0	14.0
S.D.	2.3	2.8	3.2	0.6	3.0	2.5	2.3	2.8	3.0	5.3	2.9	2.9
Minimum	12.0	3.0	4.0	14.0	6.0	10.0	12.0	7.0	7.0	5.0	4.0	8.0
Maximum	16.0	20.0	20.0	15.0	29.0	20.0	16.0	20.0	20.0	15.0	20.0	20.0

Source: Own April, 2015

Finally, to reveal the objective of the current work it was computed: the relationship between the qualities of learning, learning strategies and academic performance. See Table 3. Among the telltale correlations, highlights the relationship between academic achievement and support strategies for cognitive, social, emotional and motivational control, if consider that this scale is the least used by the participants and the academic performance of most students focus on a medium level.

Table 3. Correlations between variables

	Acquisition strategies	Coding strategies	Recovery strategies	Support strategies
Academic Performance	0.12*	0.10	0.13*	0.16**
Active Style	0.029	0.01	0.02	0.01
Reflexive Style	0.20**	0.13*	0.22**	0.22**
Theoretical Style	0.24**	0.16**	0.27**	0.35**
Pragmatic Style	0.21**	0.11*	0.10	0.21**

*p < 0.05, bilateral. **p < 0.01, bilateral

Conclusions

The results of this study highlight as learning style most used by research participants, theoretical; this suggests that students frequently use abstraction to form conclusions, both

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methodical and logical level, and seek new learning approach in an objective, critical, structured and planned.

It should be noted that the participants of this research were studying third and second semester of theirs career, which coincides with the point made by Alonso, Gallego and Honey (1995), Camero, Martin and Herrero (2000), Pujol (2003) and Peinado (2007) who state that: in the first semesters in university, the predominance of pragmatic or theoretical learning styles.

Meanwhile, the lowest style called on students was reflective, which means that few people working under pressure or mandatory deadlines, research, work carefully, be responsive and meet the new analytical information offered in training careers

Moreover, data collected with CHAEA show that most participants do not use one style or learning mode, making it possible to identify combinations of different styles, suggesting some multimodality in student performance when making processes to acquire new knowledge and learn

While it is true that learning styles are patterns of behavior, they are usually not fixed, predetermined, however, they may change depending on the situation of learning and experience that is acquiring the apprentice. As for the transformation of these, research shows that students modify their learning styles to the extent that advances in his studies, which could show a process of cognitive adaptation to university life and teaching strategies used by educators . Accordingly, it is important that students be taught to identify their own style to mobilize effective learning (Revilla, 1998). As for learning strategies, which are understood as purposeful activities are reflected in the four major stages of processing new information (acquisition, encoding, recovery and support), we find that the students of this institution indicate significantly higher in using two or more strategies, often used simultaneously when studying. This means that students have evaluated more complex processes for the acquisition and interpretation of the information and the simultaneous use of different strategies expose a fortress student while more resources have to face learning tasks. However, the highest scores were obtained for coding strategies, except for students Accounting program (notably the use of procurement strategies) and Management and International Business (highlighting the use of strategies, recovery). This indicates that it is common to use processes that contribute to the organization and processing of information by establishing different structures for data processing in order to make sense of new information, a question that may be associated with

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the competencies required in these careers as demanding pragmatic skills for their professional performance.

The data collected in this study suggest that participants use a theoretical learning style learning strategies often employ encryption, reaching an average academic achievement (between 70-79). This information is consistent with academic averages of the participants, and the scientific literature suggests that in order to obtain a high performance, students should use mainly support strategies (Roman and Gallego, 1994).

In summary, the results of this research show the need for an explicit and systematic teaching of learning strategies and / or study skills imparted to students, as seems to be the best way to ensure that learning is most successful.

That is, the academic programs should not only focus on providing the technical content of their discipline, they should also strive to teach students how to efficiently acquire this knowledge. This proposal should include training teachers on how to teach their students to have better learning strategies considering their learning styles, so that they can include didactic elements that promote student learning.

Future studies should seek to broaden the sample to include students of all careers or the whole university and even other universities, studying in public schools.

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An Analysis Of Education Administrators On The Importance Of Family In Relation To Technology Based Student Rage and Aggression

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Abstract
Knowledge and technology are believed to be the two most important components of an enlightened society. At an era when change and development are a necessity, it is required that society alongside the individual adapt to this change and development. Schools are regarded as the most appropriate institutions to ensure that this happens. It is a social structure, which the student, the teacher, the vice principal, the principal, the secretary and the school service provider make up and is affected by each member. This social structure in the school is formed within the school management and is affected by the internal elements such as the principal, vice principal, the teacher, the student and the school service provider. The parents, the district of the school, the social groups near the school premises, the quality of existing administration and working conditions are external elements, which internally affect the school. Schools have to fulfill their obligations necessary for meeting the requirements of an enlightened society and thus have to be capable of adapting to the changes and readjusting the roles of those contributing in the education process.
It is essential that those who actively partake in education incorporate technology in the process since technology has an effect on the development of education. This necessity may also lead to adverse outcome such as rage and aggression stemmed from using technology. It is believed that the correct intervention and prevention by school administration can minimize the negative effects of technology used as vital tools in the education process. Parents play a very crucial role in the education of their children; thus, it is in the best interest of the school to have their support and cooperation. As the importance of education within the family unit has gained significance, there has been a tendency to have the parents become more proactive within the education process. The parents' role in the overall shaping the child enables the school's ability to do its job effectively. A successful education's foundation is based on the cooperation between the education institution and the parents. They should be enabled to work in tandem with each other.

The research was conducted over the period of 2013-2014 and 2014-2015 academic years and it was implemented in all of the state and private secondary education institutions within the borders of Nicosia. All employees from senior management to staff partook in the study. In this qualitative study, a semi-structured interview form was prepared. By responding to the questions, the education administrators were able to put forth their views about the rage and aggression caused by the use of technology amongst the students and the effectiveness of the role of parents in determining the students' behaviors. The interviews were taped with the consent of the interviewee in order to avert any loss of data.
The results of the qualitative study determine that parents are very influential in the development of technology related behavior of rage and aggression among students. Involving parents as active and cooperative participants in studies toward solving these behaviors with the school may prove to have fruitful and effective outcomes.

Key words: Education administrators, Technology, rage, aggression

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Introduction

The cultural transformations resulted by the impacts of technological developments have fundamentally affected the lives of people. While the individuals, who are the smallest building blocks of society, have been looking for solutions for the problems that they encounter in different areas, they developed their own methods, techniques and technologies for their needs in addition to the existing technology and induce development and change of existing as well. The development of technology facilitates the human life and addresses the needs of people as well as has an impact on the development of society. The frequent use of technological means in every day life has established the technology culture. The frequent use of technology by individuals has lead to create a new life style. The way of communication, transportation, working styles, terms used and perception to understand everything have significantly changed in this life style called as technology culture (Beşli, 2007).

All values of individuals used for technology have changed significantly. While communication becomes easier due to technology, this easiness has brought many disadvantages as well. It is possible to say that technology affecting the social relationships of individual isolates the individual. Technological devices such as cell phones, internet, computer and telephones of today's technology have entered the lives of people at a young age, therefore they affect the people without knowing, their utilization is considered to be a normal thing while they generate a perception that accept the use of such technological communication means is normal and a part of their lives and culture. The discussions and studies on the impacts of technology on social life have started in the last few years. In this perspective, "*although the large scale impacts of developments have taken into consideration, there is no idea how it will affect our inner circle. It is very normal to have important changes in behaviours and attitudes with the introduction of each new technology into our homes, workplace and other life environments*" (Naisbitt, 2004; Akt:Beşli, 2007).

The adolescents daily encounter aggression and violence affecting their lives and society in the visual and printed media (Yıldız, 2004). Moreover, pursuant to the need for socialization related with the needs of society, people may face with aggressive behaviours while they communication with their surrounding (Hasta and Güler, 2013).

Özdevecioğlu and Yalçın (2010) described the aggression as "*all kinds of course of action aimed to physically or emotionally harm any living or non-living thing*" and it has inherited

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and learning characteristics. Such behaviours may be inherited and all may arise as a result of qualities in the living environment and past experiences (Gültekin, 2011; Dökmen, 2013).

Yavuzer (1992) and Kulaksızoğlu (2004) stated that the behaviours associated with rage and aggression are mostly encountered during adolescence and behaviour disorders, and offenses resulting these emotions and behaviours mostly occur within this period. Moreover the increase in the physical strength during adolescence and enjoying the violence associated with the environment trigger the arise of aggressive behaviours.

Nowadays many children and adolescents have their own technological devices like cell phones, internet and they mostly communicate through internet. Social networks, which taken over the face-to-face communication, gradually deteriorate the social relationships and isolate people. Communication is a fact realized within the process and in general socially and in private personally interacts. Individuals can socialize via communication. The introduction of modern communication technology means at the time of technological developments has changed the communication process. Since communication between people is performed through these means, the exposure is inevitable. Cell phones, television and computer are the most used technological devices while they cause limitations in the communication between people (Özaydın, 2010).

Denis McQuail addresses that when individuals spend time with the communication devices in their daily lives instead of people, the socialization will be hindered (Mutlu, 1991). With the use of modern technology devices such as television, computer, cell phones, all kinds of things in human life have become easier, yet many challenges arise. Some of the problems are the hindrance of socialization and divergence of people, side effects that may have deep impacts on people, non-adaptation to developing and changing conditions as a result of technology, personal complexes in changing conditions, insensible spending, problem that not every person has the technological devices and negative reactions with the reason of not owning (İlhan, 2005). People may perform involuntary behaviours without any awareness (Özaydın, 2010).

"Social networks are a popular type of online communication among adolescents" (Subrahmanyam, Reich, Waechter and Espinoza, 2008). Internet and social networks, which gradually increase their practicality to access and use information, ensure comprehensive

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socialization in children and adolescents and change the fundamental qualification of life as well as the way of interaction between individuals (Subrahmanyam and Greenfield, 2008; Özmen, Aküzüm, Sünkür and Baysal, 2011). Since social media is routinely updated, used by many people, enable to share in various subjects in social networks; it is one of the most used technological developments. The number of people that use social networks increase though the possibility of sharing due to social media, exchange ideas between close and distant surroundings (Vural and Bat, 2010)

Family is the place where the roots of children in terms of knowledge, value and behaviours, and value of judgements, tastes and choices of families affect the life of child. Perspective of family on education, status within the society, income level, environmental factors and cultural factors, way to approach and raise child, education levels of parents, number of people in family have an impact on the behaviours of child in school and classroom (Çelik, 2008; Erdoğan, 2008; Erden, 2000). Arguments within the family and raising the child under pressure have no positive impact on the child and also may affect the academic success during learning process. In accordance with the possible impacts, the family should be recognised by school administration and teacher. The teacher and school administration with knowledge on family may create the learning conditions that may bring positive outcomes (Aydın, 2009; Çalık, 2009). A good dialogue between teacher and family may ensure the effectiveness of determined school norms and adoption of desired behaviours and attitudes by students (Sarı, 2004). A student, who is aware of the dialogue between the teacher and family, try to perform positive behaviours involuntarily (Celep, 2004).

According to the study of Aksoy (1999), the teachers expressed the reasons for undesired negative actions as family problems, not shoeing any attention to the child, performance of negative actions and maltreatment to children, television problems with bad content, violence in media and crowded classrooms (As cited in: Balay and Sağlam, 2008). Pursuant to the changes in social environment, non-determination of controlled standards following the adoption of changes by individuals, increase in information and occurrence of non-adoption of a specific administration are expressed as different reasons (Okutan, 2002).

With regard to the many research results conducted by different people, media particularly television has an impact to perform involuntary activities. As a consequence of watching television for three hours and more than three hours, the attention span becomes poor and

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children develop the desire to enjoy more from the television instead of performing their responsibilities (Web et. al., 1992). Individual act in the way that just like all the actions in television programs, actions based on aggression and rage are acceptable. As Özbay and Eren (1997) mentions individuals, who watch television for a long time, perform more aggressive behaviours than the ones watching for a short while. Individuals may easily confuse something imaginary and real, and may repeat the physical violence and uncontrolled actions seen on television. An individual, who frequently watch such scenes, perceive the aggression kind of behaviours are normal and start to perform. Thus, undesired actions including aggression, rage, violence and power are first encountered in environmental culture and then in school environment. (Kuykendall, 1996).

As a result of Gerçel's (2015) study conducted regarding the impact of average time of using technological devices by students on aggression and rage behaviours, the average figures showed that the highest average figure is between 7-11 hours. As a consequence of spending too much time on technological devices, students have sleeping disorders, involuntary doing homework, weariness, insufficiency for mental based activities, involuntary behaviours (rage and aggression).

The most important resource for the behaviours of individuals is family, environment that people live in and school. There might be more than one reason for the undesired actions in school. While these reasons may arise from any factor in school, family and environment may be the other factors. In order to eliminate these actions, the family, who shape the general aspects of a child, should have an active role in school.

Method

Research Design

This is a qualitative study. "A qualitative study is defined as being a study that utilizes observation interviews and document analysis for data collection in a qualitative research duration." (Yildirim and Şimşek, 2011). According to Kuş (2009); "The fundamental property of a qualitative study is that the researcher is able to see the world through the eyes of the participants because the participants weigh in their opinions on the matter and reveal their inner world during the study."

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Data Collection Tool

In this qualitative study, a semi-structured interview form was prepared. By responding to the questions, the education administrators were able to put forth their views about the rage and aggression caused by the use of technology amongst the students and the effectiveness of the role of parents in determining the students' behaviors. An interview is the most widely used technique. This technique aims at capturing and understanding the relativity of social facts. The most important advantage it has is that it is enables the researcher to understand the interviewees' perspectives about the subject and to uncover the social process in which these perspectives were formed (Yıldırım and Şimşek, 2011). Quite often, a qualitative study is utilizes in-depth interview (face to face interview), direct observation and document analysis techniques (Legard, Keegan and Ward, 2003). The data of this qualitative study was collected by means of 'face to face interview technique', which unlike other data collecting techniques, allowed access to the perspectives of those participating in the study. In-depth interviews are advantageous in that there is flexibility in the order of which the participants answer the questions, the information about the subject may be elaborated on, the setting in which they take place can be controlled and the response rate is high (Yıldırım and Şimşek, 2011). This technique reveals many aspects as to why the participants responded as they did; such as, their emotions, their thoughts and their beliefs. This technique reveals the many underlying aspects for the reasons of the responses the participants gave; such as their emotions, thoughts and their beliefs (Legard, Keegan and Ward, 2003).

Interviews are comprised of three styles; the conversation style interview, the standard open-ended interview and the form based interview (Patton, 1987, cited: Yıldırım and Şimşek, 2005). This research was conducted with a semi-structured interview form. This technique was used because it allows the researcher the flexibility of composing questions at the time of the interview, changing the order of the questions and intervening with the duration of the interview when necessary. The administrators participating in the study were asked to answer questions in the semi-structured form related to the study of how the use of technology triggered anger and aggression in adolescents. The interview was taped with the consent of the interviewee to avert any loss of data throughout the study.

The semi-structured interview forms of the qualitative study comprised of questions that allowed the school administrators to reveal their exact views on the effects of technology. The interview form was presented to faculty members of Near East University, Faculty of Education, and Department of Education Sciences for expert opinion in order to maintain internal validity. The form was revised upon the feedback. Next, an interview was

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administered to a pilot group with equal merits of the focus group. This established whether the questions were clear and understandable and whether the given answers reflected the conceivable answers of the questions in the form. Later, to assure that the questions on the interview form were clear and understandable, that correct grammar was used and that all the questions were related to the research topic, the interview form was inspected by Pedagogical Guidance specialists, education administration specialists and Turkish linguist specialists. It was surmised that the form met all the measures for correct data collection. Content analysis was used to analyze the data obtained from the forms answered by the participants of the study.

Universe and Sampling

The study was conducted in all public and private secondary education institutes (a total of 14 schools) within the borders of The Nicosia Municipality during the 2013-2014 and 2014-2015 academic years.

1 principal and 1 vice principal (a total of 22 participants) was chosen from each school within the borders of the district of Nicosia, T.R.N.C, to participate in determining the main objective of the study 'An Analysis Of Education Administrators On The Importance Of Family In Relation To Technology Based Student Rage and Aggression'.

Data Collection Process

Interviews with all of the school administrators working in state and private schools within the district of Nicosia, North Cyprus were conducted during the data collection process. The participants were advised about the study and the technique that was going to be applied prior to the implementation. Appointments for the implementation dates were set up with the volunteer participants and the data was collected during the Fall of 2013-2014 academic semester. The data collection process began after obtaining the necessary permission from the Ministry of Education.

Each face to face interview with the administrators took approximately 20 minutes. The ethics of confidentiality and the use of a recording device during the interview with the consent of the participant was taken very seriously. In order to avoid any confusion during the interview, along with the recording, meticulous notes were taken.

Analyses of Data

Each answer given by the participants was categorized and entered in a table. After this initial categorization, the data was analyzed again by the researcher and basic themes/topics and categories were established. Taking in consideration the body of literature, the themes and

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categories were analyzed once more and categories with similar patterns were merged and those that were different were collected and coded under a different category. A number was assigned to the administrator who answered the question and was entered beside each of the categories. Example sentences taken from the categories were written in the statement section. The individual interviews were carried out by visitations to school administrators at their place of employment during hours that were suitable for them. The face to face interviews with the administrators were implemented in settings that were appropriate for interviews.

The data collected from the answers to the questions was analyzed by method of content analysis. Content analysis analyzes the in four stages (Yıldırım and Şimşek, 2000).

1. **The Coding of the Data:** At this first stage of content analysis, each of the participants are assigned a number. After the interview forms are broken down, the data collected from the participants is examined within the frame of the study they are coded accordingly. After all the data is reviewed, the final form of the code list is prepared in accordance with the conceptual framework of the research and the answers of the participants. This code list has been used as the key list in the data organization. The data that was not relevant to the survey questions were left out. Later, each of the semi-structured interview forms were analyzed by the researchers using the coding keys and after the discussions on topics of 'agreement' or 'disagreement', the necessary adjustments were made. For the calculation of reliability, the reliability formula recommended by Miles and Huberman (1994) was implemented and the outcome was a reliability of 94% on average. A research is accepted as reliable when the outcome of the calculation of reliability is over 70% (Miles and Huberman). The result obtained from this calculation makes the research reliable. The conformation of the coding designed by the researchers and the codes was selected as a baseline to attain the themes.

2. **Finding the Themes:** At this stage, each data was established as a different category and was evaluated as different themes during the coding stage.

3. **Organizing Data Based on Themes and Codes:** At this stage the views of the participants have been explained in a manner in which the reader can understand and this is given to the reader by first hand. As to reveal which participant the notes belong to, footnotes have been used and notes from the interview have been specified in quotation marks. The following is an example of the coding system:

EXAMPLE: "……." (I:S(1)), (I:P(1)).

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I: Interview; P: Private School Administrator; S: State School Administrator; 1: First Participant

4. **Interpretation of Findings**: The data that has been thoroughly defined and presented is interpreted by the researcher and some results are presented at this last stage. The data undergoes the necessary steps of a qualitative study and certain conclusions are derived from the interpretation.

Findings

In this chapter, the findings acquired through the analysis of data collected by data collection tools and comments of participants are presented in all dimensions.

1.Dimension: Comments of administrators regarding the rage and aggression behaviours of students as a result of using technological tools

Table 1:

THEME	PRIVATE SCHOOL ADMINISTRATOR				PUBLIC SCHOOL ADMINISTRATOR			
	Participated	Not participated	Total	Percentage	Participated	Not participated	Total	Percentage
Reflection of family problems to school	4	4	4	100	100	14	4	18	77.7	77.8
Family participation	-	4	4	0	100	8	10	18	44.4	55.6

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Reflection of Problems To The School

For the determination of administrators' comments regarding the rage and aggression of students due to using technological devices, private school administrators expressed that 100% of students reflect their family problems to the school, whereas for the public school administrators, 77,7% of students experience similar problems and reflect their rage and aggression to the school.

During our interview, one of the public school administrator said: "… Our students are always on defence. They are not tolerant towards their friends and teachers. The reason behind such behaviours is not only technological devices but their families and lifestyles."(I:S(18)), other public school administrator says; ".... Basic education based problems, insufficient education (family life) cause rage and aggression. Therefore, all create problem in education process. The major reason of this is considered as family. Then they first show their anger towards the family. "(I:S(1)). One of the private school administrator said: ""....the student leaves the school and goes home and be angry to their friends, environment and show aggressive behaviours. Arguments with the family start "(I:P(3)).

Family Participation

For the determination of administrators' comments regarding the rage and aggression of students due to using technological devices, none of the private school administrators has expressed any comment regarding families, 44,4% of public school administrators mentioned that families have a lack of interest and show no support to school.

One of the public school administrators noted as "....We solve together with family, school counsellor, administration by ensuring them feeling loved. We include family into the school (we try to provide family participation even though it is difficult). Parents are not sensitive." (I:S(8)) while another says "... I believe education is the basis for everything. Of course the exceptions do not break the rule but we see that it decrease with the cooperation of education and family." (I:S(12)).

Results and recommendations

For the determination of administrators' comments regarding the rage and aggression of students due to using technological devices, private school administrators expressed that 100% of students reflect their family problems to the school, whereas for the public school administrators, 77,7% of students experience similar problems and reflect their rage and aggression to the school. The families and students should be informed more on the use of technological devices. In the perspective of formal education, in-service courses to be organized out of working hours may ensure to provide sufficient information to family and students.

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For the determination of administrators' comments regarding the rage and aggression of students due to using technological devices, none of the private school administrators has expressed any comment regarding families, 44,4% of public school administrators mentioned that families have a lack of interest and show no support to school. While there is no family participation in private school on the measures takes in order to eliminate the rage and aggression behaviours based on technology use, the participation in public school is very low. This situation can be interpreted as there is no cooperation between school and family in the implementation of school rules, there is an insufficient communication between school and families. For an effective and efficient education process, the cooperation between families and school should be strong. Cooperation between school and family should be ensured and families should have active roles in education process. As Celep (2004) states the student, who is aware of the dialogue between teacher and family, tries to perform positive behaviours without on purpose.

The events caused by rage and aggressions have increased constantly and become one of the major problems of 21st century. In the past recent years the violence actions in schools have increased. Because of all reasons, rage and aggression are emotions and behaviours that need to be taken under control in the way to contribute on the development of individuals under adolescence, which is the re-organization of personality. Individual should identify and embrace the sense of rage just like other senses and learn the skill to express in a sensible manner (Öz, 2005).

In the environment that we live in, rage and associated violence aggression pose major problem in family and school. Especially the problems encountered in school cause the administrators, teachers and families to be concerned. The rage-associated behaviours are considered to affect the school atmosphere in a negative way and decrease the school efficiency. Not only the expression of rage or rage-associated behaviours in school by students will cause failure in students, but also those may lead failure in their school activities as well (Fryxell, 2000). Adolescents with poor-success are called as problem students by the staff of school and parents (Danışık, 2005). In order to establish an organized and efficient school atmosphere, problem behaviours should be corrected through solutions and strategies.

Due to the benefits of technology use to human life, technology has become irreplaceable for our lives. Technological products, at every field of life, have both positive and negative

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impacts. Cell phones, tablets, internet, other computer models are essential for daily life. Modern technology, apart from its positive impacts, may negatively affect people but particularly children and adolescents in terms of mental, emotional and physical aspects. There are some research arguing that technology may cause attention deficit, concentration and difficulty in solving the problems that require time.

According to the data, both public and private school students experience family based problems. Especially private school students, who spend most of their time in school and spend so little time with their families, have problems in the communication with their parents. Thus the student feeling rage towards his parents reflect this situation to the school. Also the problems for the public schools may be caused by insufficient time spent by families and differences in family structures. Students should be guided to be socially more active and be more enthusiastic to be involved in physical activities. Families should be actively responsible and encourage their children.

The tastes and skills of individuals are based of family. The actions are shaped in parallel with the models reflected by families. Since they spend majority of their lives in family environment and start to shape their humanistic relations, the actions resulting negative outcomes are also based on family too (Türnüklü et. al, 2001). When an individual is not with his family as much as he needs, he spend the time with technological devices. Technology addiction and rage and similar undesired reactions towards the family may arise. Considering the fact that rage and aggression based behaviours arise due to limitations, the factors lead to limitations should be eliminated. Therefore, families should work to meet the needs of students in terms of attention, desires and expectations. Student counsellors and psychological counsellors may provide support respectively.

The inclusion of family variable apart from administrators and teachers is recommended in the studies to be conducted on the subject. Cooperation between school and family as well as active participation of family in education process should be ensured.

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An Examination Of Mobile Learning Studies Using Activity Theory As A Theoretical Framework

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Abstract
The objective of this study is to analyze mobile learning studies that use activity theory as a theoretical framework. Activity theory attempts to understand unity of the consciousness and activity, and is a powerful instrument that involves the concepts of object-orientedness, history, mediating, collaboration and development in constructing consciousness; it is a guide rather than a predictor. It has been suggested that learning in activity theory takes place in conjunction with subject, object and tool, and that cultural tools mediate activities. During the preparation of learner-centered applications, taking the social and cultural environment of the learner into account can develop systems. Within this context, the activity theoretical framework can be used for mobile learning. Activity theory offers a powerful approach as it allows for an integrative analysis and assessment, through a theoretical and methodological perspective in designing mobile learning environments. We are of the opinion that, since this study provides some cases in regards to the designing of mobile learning environments based on activity theory. Also, it contributes you how activity theory can be used in mobile learning studies.

Introduction

As a result of the rapid advancement and widespread use of technology, which has become an indispensable part of our lives in the 21st century, mobile technologies and applications have begun to play a part in education, as well. Rapid changes in mobile and web technologies have led to a paradigm shift in education. Learners, tools and content have gained mobility, possibilities for interaction and cooperation have increased, and learner-centric mobile learning has become a popular interdisciplinary field. Building and designing mobile learning environments on strong foundations is important for people to adopt and accept mobile learning. Within this context, one of the theoretical and methodological approaches that have been used is activity theory.

Activity theory attempts to understand the unity of consciousness and activity, and is a powerful instrument that involves the concepts of object-orientedness, mediation, collaboration and development in constructing consciousness; it is a guide rather than a predictor (Nardi, 1996). Activity theory is a dialectic theory in which contradiction plays an important role; the purpose of an action is always an inner contradiction (Engestrom, 2010).

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Learning activities can be performed by a historical analysis of the inner contradictions of dominant forms of human learning that have been arranged by society (Engestrom, 1987). The activity theory framework can be used to understand developmental studies, to explain learning context in the real world, to develop new research methods, to design human-computer interaction systems, to discover theoretical concepts and to provide planning solutions for complex business-based problems (Lynch, 2010). This study aims to analyze mobile learning studies that use activity theory as a theoretical framework.

Mobile learning

When one looks at the historical development of mobile learning it turns out that it is based on the Dynabook concept, designed as a personal computer for children in the 1970s (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sánchez and Vavoula, 2009). In the 1980s the first experimental mobile learning applications were implemented with Microwriter (Psion Computer) for palm devices. In the 1990s, however, mobile learning research projects for personal digital assistants (PDA) and tablets began to attract attention. The most significant developments in the recognition of mobile learning have been the MOBILearn project that was accepted by the European Commission between 2001 and 2003, as well as conferences and workshops organized in the field of mobile learning (Casey, 2009).

There are many different definitions of mobile learning in the literature. Traxler (2007) defines mobile learning as an educational process in which handheld computers and palm computers are used. According to Keagen (2005) mobile learning is facilitated by portable devices that can fit in women's handbags, and the pockets of men's shirts and trousers. In general, mobile learning can be defined as learning that allows learners to access educational content without being restricted to a particular place, to benefit from dynamically generated services, to interact with others; that instantly responds to the individual needs of the user in order to increase productivity and business performance; and that is facilitated by mobile technologies (Ozdamar Keskin, 2011). In recent years, four basic structures have played a part in mobile learning definitions. These are pedagogy, technology, context and social interaction. Using these four basic structures, Crompton (2013) defines mobile learning as learning which is actualized in various contexts, and by content and social interactions, where electronic devices are used.

Just as there are many definitions of mobile learning, there are also different approaches to

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mobile learning. While some of the researchers in the field define mobile learning as a sub-field of e-learning (Georgiev et al., 2004; Park, 2011), others defend mobile learning as different from open and distant learning, in that it is an interdisciplinary field which created a paradigm shift in education, and argue that mobile learning theories should be developed (Kitchenham, 2011; Parsons, 2013). Both of these approaches emphasize that beyond being just technology-centric, mobile learning applications should also be learner-centric. One of the theoretical and methodological approaches preferred in mobile learning is activity theory.

Activity theory

The roots of activity theory, which is based on the Soviet research tradition, are predicated on Classical German philosophy, which emphasizes developmental and historical thoughts, activities and human consciousness; on the dialectic materialism of Marx and Engels, which explains the concept of activity and suggests that human beings are not only products of evolution or assimilators of culture but also creators and transformers of them; and on the studies of Soviet-era cultural psychological researchers Vygotsky, Leont'ev and Luria (Engestrom, 1987; Kuuti, 1995). Activity theory takes as its center Dewey's pragmatism, and Mead's social consciousness for physical objects and the priority of social objects. The theory is an interdisciplinary approach which resembles symbolic interactionism theories which argue that the social and interactive structures of physical objects are actualized through symbols (Engestrom, 1987; Kuuti, 1995).

The objective of activity theory, which is a powerful descriptive tool, is to explain the unity of consciousness and activity (Nardi, 1996). With this aim in mind, activity theory involves the concepts of object-orientedness, historicity, mediation, collaboration and development in constructing consciousness, and is interested in the development and functions of personal consciousness (Nardi, 1996). Activity theory provides a framework for understanding and analyzing human activities, and allows for the putting forward of necessary elements in understanding and forming complex learning environments. According to activity theory, activity means all engagements that are interconnected, stable, longer than actions, predetermined or natural, but which have definable goals and targets (Karakus, 2013). Learning is seen as the result of social interactions that emerge from interactions between both humans and objects (Karakus, 2013; Winn, 2002).

In the activity system model each component has a meaning and purpose. In activity

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theory, the subject indicates the individual or group whose points of view are taken in the analysis of the activity (Engestrom, 1993). The object, however, expresses the problem areas in which the activity is managed; in which it is shaped by means of physical and symbolic, internal and external tools (intermediating tools and symbols); and converted into outputs (Engestrom,1993). A community contains one or more person or groups who share common general objectives; division of labor includes both horizontal divisions between the members of the community, and vertical divisions of power and status; rules include open and covered arrangements, norms and agreements, which restrict actions and interactions within the activity system (Engestrom,1993). In order to understand communication between systems, multiple perspectives, statements and interaction networks in activity theory, conceptual tools have been developed, and the base model has been expanded to encompass interactions between activity systems (Engestrom, 1987).

Engestrom (1987) proposed that activity theory could be divided into three generations. In First Generation Activity Theory, which places Vygotsky's studies and the concept of mediation at the center of the theory, the trio of subject, object and tool are dealt with within the context of the social environment from which human activities are affected (Engestrom, 1987). In this approach human activities are mediated by culturally defined and created signs and tools. In order to achieve the results (goal), the subject (person) gets into an interaction with the object using the mediating tools such as language, symbols, ideas and technology (Cowan and Butler, 2013). Object-oriented activities have become key to an understanding of human psychology (Engestrom,1987).

Inspired, to a great extent, by Leont'ev's studies, limitations in First Generation Activity Theory, which concentrates on individualism, have been solved by Second Generation Activity Theory (Engestrom, 1987). In this generation, which talks about object-oriented activities, activity is associated with divisions of labor and collaborative working. Its objective is the important differentiation between individual action and collective activity through the historical evolution of divisions of labor. The objective of an activity is its motive. From this perspective, the concept of activity is associated with the concept of motivation (Engestrom, 1987). Activities are realized by target-oriented actions that are linked to conscious goals; motor or mental actions are the objects of cognitive psychology, of skills and performances; human applications are not the sum of actions only; within this context, activity is a molar, systemic formation (Leont'ev, 1978).

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Second Generation Activity Theory remained insensitive to cultural diversity, but diversity between different traditions or perspectives, and communication problems, became problems of increasing significance (Engestrom, 1987). In order to explain the interactions between systems, therefore, Third Generation Activity Theory was developed. In Third Generation Activity Theory, in order to understand communication, multiple perspectives, statements and interaction networks, conceptual tools were developed, and the base model was expanded to include interactions between activity systems (Engestrom, 1987).

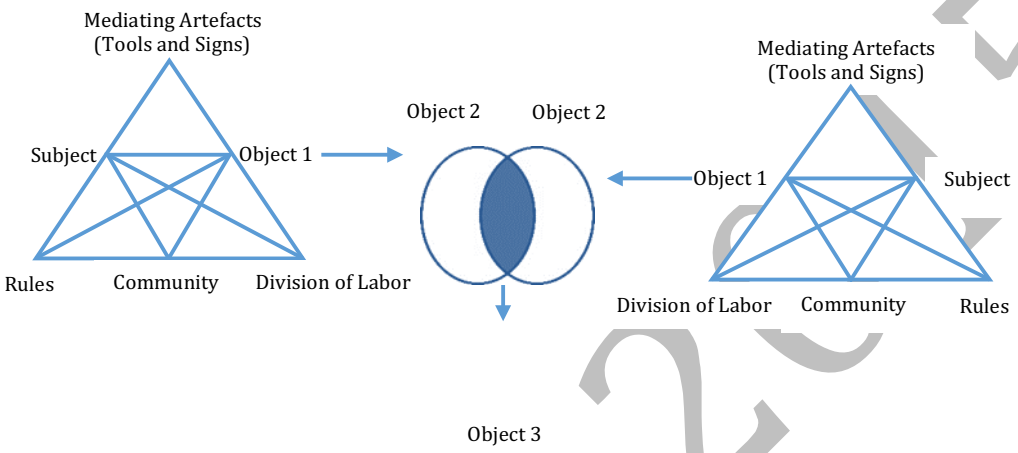


Figure 1. Two interacting activity systems in activity theory (Engestrom, 2001).

The basic features of activity theory are as follows (Kaptelinin, Nardi and Macaulay, 1999):

1. Object-Orientedness: Each activity is oriented towards objects that exist in the world. In activity theory, the concept of an object indicates not only the physical, chemical and biological characteristics of people, but also their socially and culturally defined characteristics. Activity is a supplementary element to a person's social life, and this includes the daily social activities of people who are motivated by goals and objects (Yamazumi, 2006).

2. Hierarchical Structure of Activity: In this theory, three levels are mentioned: activities, actions, and operations (Leontev, 1978). In the analysis of an activity system, actions and operations are very important. An activity contains many actions and operations. An activity is made up of many smaller actions, whereas operations constitute single actions. Each action has an objective, however this objective is smaller and takes a shorter amount of time than the objective of the activity. Operations, on the other hand, can be thought of as routines that are

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sometimes performed consciously and sometimes performed automatically in a subconscious manner (Leontev, 1978; Karakus, 2013).

3. Internalization and Externalization: According to activity theory, internal activities cannot be considered separate from external activities, because there is a constant transformation between internal and external activities that are the bases of human cognition and activities.

4. Mediation: Mediation is the fundamental principle of activity theory. The concept of a tool in activity theory encompasses both the technical tools by which physical objects are processed, and the psychological tools that humans use to impress themselves and others. Social factors in activity theory, and its emphasis on interactions between people and their environments, explain that mediation plays a central role in the theory.

5. Development: Activity theory requires an analysis within the context of reality and developing human interaction. In activity theory, development is not only the objective of the work but also a research methodology. The reason for activity theory being a fundamental research method is the formative experiments that combine active participation with monitoring of developmental changes in the objective of the work.

All the products that come out as a result of an activity system are outputs, and these outputs can be tangible or abstract. On the other hand, the contradictions in activity theory are used to explain the incompatibilities that emerge within elements, between the elements, between different activities or in the development stages of a single activity (Karakus, 2013). When a new factor is added to an existing activity system, a contradiction emerges. An example for this is the teacher who uses a smart board to facilitate better learning in students and who acts in a teacher-centric manner, to conform to a teacher's traditional role in the classroom.

The development principle emphasizes that activity theory can also be used as a research method. When activity theory is utilized as a method and an analysis of systems is performed, researchers should develop questions that address mediating activities (Lynch, 2010). Subsequently, in order to catch special information about mediating operations, participants should design data gathering methods (Lynch, 2010).

Activity theory can be used to understand context in the pre-analysis stage of learning

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environments and technologies, in determining environmental conditions, and in the development stages of environment (Karakus, 2013). In the related literature and studies on integration of technological innovations with education, it is observed that activity theory is used as a method to put forward the factors that impede or support this integration in the environment (Blin and Munro, 2008; Issroff and Scanlon, 2002; Lim and Hang, 2003; Lim and Chai, 2004). Also, activity theory offers three main advantages: (1) the application specifications are provided, (2) the design obtained is extendable and adaptable and (3) it can be used for analyzing social and cultural practices to provide a language to describe what people do in context (Mwanza, 2001; Zurita and Nussbaum, 2007).

Activity theory-based mobile learning framework

For mobile learning, a generally accepted learning theory has not yet been established; however, there are various approaches. One of them is the activity theoretical framework of Sharples et al., (2007) which shows that mobile learning differs with respect to the location, time, subject and technologies used. Sharples (2009, p.237) defines mobile learning as the "specific and general learning processes where people use interactive technologies to explore and interact in multiple contexts" and draws attention to the importance of context. Context emphasizes both in-classroom (formal) and out-of-classroom (informal) learning experiences. Context is an important element in the integration of mobile technologies with educational environments (formal and informal). As Figure 2 illustrates, when Sharples et al. (2005) developed this theoretical framework, they benefitted from Engestrom's activity theory and dealt with mobile learning as the interaction between the tool, subject, object, control of learning, learning content and learning communication components.

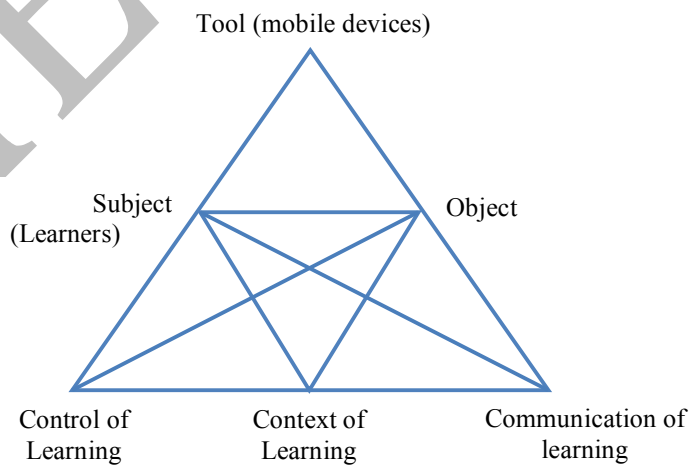


Figure 2. A framework for analyzing mobile learning based on activity theory

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Table 1 presents component based on activity theory and m-learning perspectives. According to Liaw (2010), Sharples et al (2005) lightens the dialectical relationship between technology and semiotics. In this relation, we meet new terms including control, context, and communication. "The control of learning" means learners' autonomy (learners self-regularity). Thus, learners can control the learning pace and the style of interaction. "The context of learning" focuses on the quality of system interactive functions, physical context or learning content. If the system has high quality interactive functions, the learners will be more satisfied. The other term is the communication of learning in the framework. "The communication of learning" highlights that the system needs various communication forms (such as discussion, chat, e-mail) if the learners adapt the communication and learning activities. Therefore, the combination of these factors makes active learners, provides meaningful learning, and helps to performs learners' effective learning actions (intelligent, meaningful, independent and competent).

Table 1: The components based on activity theory and m-learning perspectives. (Liaw et al, 2010)

Component	Activity theory perspective	m-Learning perspective
The control of learning	• Learners directly access learning materials conveniently • Learners control the learning pace and style • Learners are independent and competent	• Systems provide self-regularity or autonomous learning functions • Learners use systems personally and independently
The context of learning	• Context is an integral property of interaction • Context embraces the multiple communities of actors who interact around a shared objective	• Systems offer functions for learning activities, such as retrieval content or information, sharing knowledge • Systems provide high quality functions to encourage and enhance learners' usage
The communication of learning	• Learners adapt their communication and learning activities • Learners invent new ways of interacting that create new rules and exclusive communities	• Systems supply various interaction and communication to support diversely learning activities • Systems provide meaningful communication • Learners use systems individually or collaboratively

Mobile learning studies based on activity theory

Activity theory can be used for (1) clarify the nature of the collaborative activities, (2) indicate how people can socially participate in them while interacting with the technology, (3) design tools to support them effectively in various contexts and (4) develop methods to put them into practice (Zurita and Nussbaum, 2007). Generally, the studies in the literature focus on using mediating tools in learning. There is the need for studies that explore the potential use of mobile devices to improve mobile literacy and access information among informal and lifelong learning and literacy settings.

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In this section, the four doctoral dissertations and one master thesis on mobile learning using activity theory were analyzed in terms of subject, object, tool, context of learning, communication of learning and control of learning. According to the results of analysis of the studies, Activity theory is used for developing methods to put them into practice in the first dissertation (Jones, 2008), clarifying the nature of the collaborative activities and indicate how people can socially participate in them while interacting with the technology in the second dissertation (Reynolds-Blankenship, 2013), analyzing the results of the study via activity theory framework in the thesis (Naicker, 2013), designing tools to support them effectively in various contexts in the fourth dissertation (Power, 2015), and indicating how people can socially participate in them while interacting with the technology (Aryee, 2014). When considering the all studies examined, it is possible to assert that activity theory offers a powerful approach as it allows for an integrative analysis and assessment, through a theoretical and methodological perspective in mobile learning. Table 2 presents the resources of the studies, analyses in terms of the components of activity framework, and findings of the studies.

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	Subject	Object	Tool	Context of Learning	Communication of Learning	Control of Learning	
Jones, R. 008). nD Dissertation uantitative esearch – ctivity Theory sed as the eoretical undation to help cus the research n the relationship etween the tivity system's bject, object, nd tool, thus osing the search gap of nalyzing physical nd cognitive ffects on mobile arning.	Eighty-four research participants (over the age of 25) 6 groups	Three trials (Dave Barry's *They Might Be Giants)*	Desktop computer Mobile device (smartphone)	While reading the passage, one of three three-task load levels (none, low or high) was imposed on participants. NASA-TLX [1] was applied to measure participants' perceived subjective workload and physical comfort. Reading and learning performances are measured. Achievement tests are applied. Physiological response (heart rate) was obtained using a Polar Electro heart rate monitor. After the experiences, it was done interview with participants about the experiment.	Learners adapts their learning activities. Interaction between learning material and a learner. Learners use system individually.	Participant read the passage on desktop computer or mobile device in a private room. Learners can control the learning pace	The results from this stud provide evidence that mobile learnir technologies with increased levels task load introduced physic ergonomic discomfort and affecte perceptions of mental workload participants. The study also provide evidence that mobile learnir technologies with increased levels task load affected the performanc (reading and learning) of participant

Resource	Activity Theory Framework						Findings
Reynolds-lankenship, T. . (2013). PhD issertation An Action esearch Study - ultural Historical ctivity Theory is sed as a eoretical undation.	A teacher and 25 Kindergarten children (the age of 5 or 6)	Free Play – İdeas Free play experiences Knowledge of games on the iPad	3 Tablets (iPad)	(hild ce nte red sys te m of rul es for tur n-tak ing (4 5 mi nut es dai ly pla y) On loo ker co mp on ent As ser tiv e lan gu ag e	Formation of groups in free play Social interaction Interaction between teacher and student	Time Alphabetical turn-taking Negotiating turn	The results from this stud provides the teacher to encourag children to make their own rules ar to provide less guidanc Furthermore, digital literacy is a important piece of this stud Findings suggest that children nee opportunities to publish and shar digitally in order to use informatio fluently and generate ne understandings. Actions are mediate by the iPad and it allows children make decisions and to collabora positively with one another.

[1] The NASA Task Load Index (**NASA-TLX**) is a widely-used, subjective, multidimensional assessment tool that rates perceived workload in order to assess a task, system, or team's effectiveness or other aspects of performance.

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Naicker, N. . (2013). laster thesis A case study Activity theory ed to analyze e results of the udy	372 Participants (Survey and as-also focus group interview) Students in the m-learning environment	Mobile learning by downloading and viewing a vodcast application	Mobile technologies Mobile learning applications Mobil network	A tte nd lec tur e bu rns fir st se of m-siz ed dat a bu ndl es for int ern et an d e-ma il ule s of m-lea rni ng at the H EI	HEI consisting of students and division/unit to support m-learning Mobile Network Operators	Lecturers using correct technology Mobil Network Operators	The results shows the majority the students require awarenes ongoing support and training assessing operational readines despite a positive attitude. M-learnir endeavor to implement m-learning this HEI is bound to fail as only small percentage of students a aware of m-learning and can affo data bundles to implement m-learnir in its true sense. As an implication this study to other HEI's, th researcher suggests that regul mobile readiness surveys b conducted.

Resource	Activity Theory Framework						Findings
Power, R. 015) nD Dissertation esign-based search approach ultural Historical ctivity Theory ed as a eoretical undation	72 teachers	Mobile Reusable Learning Objects	LMS (Canvas) for Desktop computer and mobile devices (smart phones)	Collaborative situated active mobile learning design framework (using QR cache which is utilized free online mobile web hosting services and quick response code generators, placing the emphasis in the instructional design phase on content development and pedagogical design)	MOOC collaborative and individual learning communication forms	Self-efficacy in the use of mobile reusable learning objects	The findings from this study a consistent with the rationale behir recent professional developme policy recommendations, and ac further support to calls contextualize educational technolog training in the context of supportir pedagogical decision-making.
Aryee, K. L. 014) PhD issertation equential mixed-ethods pproaches Activity eory as a nceptual amework	92 participant (over the age of 18)	Health related issues, e.g., malaria, importation of counterfeit medication	Mobile phone	Call or text friends/family, Healthcare personnel, or health agency Browse Internet for health information Challenges with Activities Information format Inquiring about	Social groups and professionals Institutions and agencies	Distributing health information Accessing health information Assisting with health-related needs Responding to health inquiries	Findings from the study show th health-related activities performed and with mobile phones include: (i) inquiring about heal concerns from friends, family, healthcare personnel; (ii) practising teleconsultatio and telehealth with health helplin that address specific health issu such as pregnancy and chole outbreak; (iii) clarifying any heal symptom before travelling healthcare centers; and (iv) scrutinizing counterfe medications entering the country.

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Table 2: An examination of mobile learning studies based on activity theory.

Conclusions

The objective of this study is to analyze mobile learning studies that use activity theory as a theoretical framework. Activity theory attempts to understand unity of the consciousness and activity, and is a powerful instrument that involves the concepts of object-orientedness, history, mediating, collaboration and development in constructing consciousness; it is a guide rather than a predictor. It has been suggested that learning in activity theory takes place in conjunction with subject, object and tool, and that cultural tools mediate activities. During the preparation of learner-centered applications, taking the social and cultural environment of the learner into account can develop systems. Within this context, the activity theoretical framework can be used for mobile learning. Activity theory offers a powerful approach as it allows for an integrative analysis and assessment, through a theoretical and methodological perspective in designing mobile learning environments. We are of the opinion that, since this study provides some cases in regards to the designing of mobile learning environments based on activity theory. Also, it contributes you how activity theory can be used in mobile learning studies.

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An Investigation Of High School Students' Online Game Addiction With Respect To Gender

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Abstract
The aim of this study is to investigate high school students' online game addiction with respect to gender. The sample which was selected through the criterion sampling method, consists of 81 female (61.8 %) female, and 50 male (38.2 %), total 131 high school students. The "Online Game Addiction Scale" which was developed by Kaya and Başol (2013) and the Biographic-Demographic Information Form were utilized as data collection instruments. Percentage documentation average and independent sample T-test were used for data analysis in this study. The result of this study showed that there is a significant difference between female and male students in terms of the online game addiction subscales of trouble, success and economic profit.

Keywords: Online game, internet, online game addiction.

Introduction

Recently, internet use has become one of the most important habits of our daily lives. Previously, obtaining information from a resource was a great problem. Yet, internet made it easier for us to receive information. This internet era is continuously developing and affecting us. Day after day internet became a medium through which we share knowledge, communicate, make shopping, chat and play games. The development of computers and faster network accelerated the advancement of internet technology. Internet became cheaper for people to reach information on the internet, and yet caused inevitable changes in their habits (Akınoğlu, 2002)

According to Young (1996), computer and internet addiction has negative influences on the people's family, academic and business lives. It is known that Internet also causes problems in interpersonal relationships. The research showed that internet addicts have relationship problems and spend limited time with others around them. In 1996 Young used the term "internet addiction" for the first time.

Cengizhan (2003) and Young (2005) also mentioned the symptoms of internet addiction as follows:

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1. Excessive mental effort on internet
2. Spending hours even though being intended to spend couple of minutes
3. Exposure to health problems due to spending hours in front of the screen each time
4. Continuously waiting for the next connection time
5. Feeling more comfortable contacting people over internet than talking face-to-face
6. Decrease in meals, lessons or work efficiency due to using internet or staying connecting
7. Trying to give or spread the mail address, chat room names etc to everybody
8. Continuously feeling sleepless and tired because of staying connected to the internet until late
9. Having failure in attempts to decrease the internet usage
10. Withdrawal syndrome due to increase in the internet usage
11. Telling lies to family members, therapist or others to be able to stay connected to the internet
12. Having affection changes in the duration of internet connection (Young, 1999; cited in, Öztürk *et. al*., 2007; cited in, Balta & Horzum, 2008).

Looking at the history of digital games, we can see that a new internet culture has emerged. Although game activities can be practiced individually, when computers came into our lives they turned into an interactive zone. Previously, the interaction was between only the player and the producer, but later it turned into a game with multiple participants. With the widespread of the internet, unlimited number of participants became involved in games (Tabanlı, 2010).

According to Kim and Park (2006, 2007), some conditions motivated individuals to play online games. For example the need for escapism, leisure, achievement, satisfaction, entertainment and the need to kill time. The findings showed that players' motivation was significantly associated with online game addiction (cited in, Khang, Kim & Kim, 2013)

Several researches have studied the behavioral characteristics of severe online game players and factors associated with online game addiction. They found that "entertainment

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and leisure", "emotional coping", "excitement and challenge seeking" and "escape from reality" may be the major factors that motivate people to play online games (cited in, Tone, Zhao & Yan, 2014)

According to Hyun et.al. (2015) there are risk factors such as sex and age, cognitive factors, psychopathological conditions such as attention deficit hyperactivity disorder (ADHD), depression, anxiety, impulsivity and social interaction such as family environment, social anxiety, self-esteem which are associated with online game addiction. Psychopathological factors especially ADHD and depression were the strongest risk factors for the online game addiction.

Computer and internet usage habit, which is defined as a new type of addiction, became an important study area that attracted the interest of different disciplines including psychology, sociology and communication (Balcı, Gülnar, 2009).

The results of the current research are expected to shed light on the future studies in the field.

The Aim of the Study

The aim of this study is to investigate high school students' online game addiction with respect to gender.

The Problem Statement of the Study

The main problem statement of the study:

"Is there any statistical difference between the online game addiction in high school students and gender?"

The following sub questions also guided the study.

1. Is there any statistical difference between online game addiction and gender?
2. Is there any statistical meaningful correlation between online game addiction and experience of computer use?
3. Is there any statistical meaningful correlation between online game addiction and experience of internet use?

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4. Is there any statistical meaningful correlation between online game addiction and online gaming?

5. Is there any statistical meaningful correlation between online game addiction and daily duration of playing online gaming?

Research Methodology

Research Design

Descriptive associational research method has been used for this study. The aim of the descriptive perspective is to determine related cases. This type of research is used to demonstrate associations and relations between two and more variables (Karasar, 2009).

The Population and Sample of the Study

The population of this research involves all high school students in North Cyprus. The sample for the research consists of 61.8 % (n=81) female, 38.2 % (n=50) male, total 131 high school students. The sample was selected through criterion sampling method of the purposive sampling. Students who had their own personal computers were set as a criteria.

Instruments

"Online Game Addiction Scale" and Biographic-Demographic Information Forms were used to collect data. Biographic and Demographic Information Form was prepared by the researcher. It consisted of 12 questions. In this form the participants were asked to answer questions related to (gender, which class he/she attends etc.) as well as computer-internet related questions. "Online Game Addiction Scale" was developed by Kaya and Başol (2013). The Cronbach's alpha reliability coefficient score of the scale is .91. In Online Game Addiction Scale there are three subscales. These subscales are troubles, success and economic profit. Troubles subscale reflects the level of the trouble experienced because of the habit of playing online games. High scores meant having high level of troubles and low score meant avoiding troubles. Success subscale indicated the level of one's "continuously playing in order to satisfy oneself and the player's gaining a sense of achievement that depends on playing online games. High success score implies high level of sense of success, while low scores mean no sense of success. Economic profit subscale refers that to the level of achieving economic gains and the effects of these gains by playing online games. The high score shows high level of economic profit and low scores show that player does not have any economic profit from online games. "Online Game Addiction Scale" has a reliability score.

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Reliability scores of subscales are .70 for the trouble subscale, .70 for the success subscale and .76 for the economic profit subscale respectively.

Data Analysis

All analysis were performed by using the SPSS for Windows. Considering purposes of the study percentage documentation average, independent samples T-test and 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, 131 students were selected using the personal computer criteria. It was applied to the high school students. The group included 61.8 % (n=81) female, 38.2 % (n=50) male students. The results of the study are presented as follows:

The first sub-question of the research: "Is there any statistical difference between online game addiction and gender?"

Table 1. Comparing Students' Gender with Online Game Addiction Scale Scores

Subscales	Gender	N	$\bar{X}$	Sd	df	F	p
Troubles	**Female**	81	1.57	.64	129	25.11	.000**
	Male	50	2.28	1.06	71.79		
Success	**Female**	81	2.38	1,15	129	.773	.000**
	Male	50	3.26	1.12	105.63		
Economic profit	**Female**	81	1.42	.59	129	50.60	.000**
	Male	50	2.38	1.34	61.28		
OGA General Scores	**Female**	81	1.85	.71	129	1.50	.000**
	Male	50	2.67	.88	87.88		

** p<.001 statistically meaningful difference

The relationship between gender and the Online Game Addiction subscales was examined through independent samples T-test.

It was determined that there was a statistical significant difference between, female ($\bar{X}$ =1.57 ± .64) and male students ($\bar{X}$=2.28 ± 1.06) and trouble subscale scores (p=.000). There was a statistical significant difference between female ($\bar{X}$=2.38 ± 1.15) and male ($\bar{X}$=3.26 ±

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1.12) students and success subscale scores (p=.000). There was a statistical significant difference between female (X̄=1.42 ± .59) and male (X̄=2.38 ± 1.34) students and economic profit subscale scores (p=.000). There was a statistical significant difference between female (X̄=1.85 ± .71) and male (X̄=2.67 ± .88) students and OGA general scores (p=.000).

The other sub-questions of the research are "Is there any statistical meaningful correlation between online game addiction and experience of computer use?", "Is there any statistical meaningful correlation between online game addiction and experience of internet use?", "Is there any statistical meaningful correlation online game addiction between playing online games?" and "Is there any statistical meaningful correlation between online game addiction and daily duration of online gaming?"

Table 2. Correlation of Online Game Addiction Subscales Test Scores with Experience of Computer – Internet Usage, Playing Online games and Duration Scores

	Experience of computer usage	**Experience of internet usage**	**Playing online games**	**Daily duration of playing online games**
OGA Trouble Subscale				
r	.237**	.174*	.451**	-.304**
n	131	131	131	131
p	.006	.046	.000	.000
OGA Success Subscale				
r	.241**	.175*	,597**	-.485**
n	131	131	131	131
p	.006	.045	.000	.000
OGA Economic Profit Subscale				
r	.273**	.194*	.457**	-.348**
n	131	131	131	131
p	.002	.027	.000	.000

** p<.001 statistically meaningful correlation

* p<.05 statistically meaningful correlation

The aim was to investigate the correlation between Online Game Addiction subscales and the experience of computer usage, experience of internet usage, playing online games, daily duration of playing online games of the students with the scores of these scales with Pearson Moment's Correlation Test applied and these results were determined.

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Statistically meaningful mild positive correlation was found between trouble subscale score and experience of computer usage (r=.237), experience of internet usage (r=.174). Statistically meaningful moderate positive correlation was found between trouble subscale score and playing online games (r=.451). Statistically meaningful mild negative correlation was found between trouble subscale scores and daily duration of playing online games (r=-.308).

Statistically meaningful mild positive correlation was found between success subscale and experience of computer usage (r=.241), experience of internet usage (r=.175). Statistically meaningful moderate positive correlation was found between success subscale score and playing online games (r=.597). Statistically meaningful moderate negative correlation was found between success subscale scores and daily duration of playing online games (r=-.485).

Statistically meaningful mild positive correlation was found between economic profit subscale score and the experience of computer usage (r=.273), experience of internet usage (r=.144). Statistically meaningful moderate positive correlation was found between economic profit subscale score and playing online games (r=.457). Statistically meaningful mild negative correlation was found between economic profit subscale scores and daily duration of playing online games (r=-.348).

Conclusions And Discussion

The present study examined high school students' online game addiction with regard to gender differences. The gender differences were found in terms of online game addiction. The males were found having higher average than females in terms of living troubles, having feelings of success and playing economic profits related to playing online games. In addition, the experience of computer and internet usage, playing online games were found to be effective factors on online game addiction.

Chou et al. examined the possible predictors of internet use of Turkish adolescents. They found that female students used internet mostly for communication but male students used mostly for playing online games and reading newspapers and magazines (cited in, Ak, Koruklu & Yılmaz, 2013). Chou et.al (2005) also studied the key factors of the internet addiction. These factors were reported as "time spent on the internet," "internet use", "identified problems" gender differences, psychosocial variables and computer attitudes. In

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this study it was found that men had more the internet addiction than women. Especially, Morahan, Martin & Shumacker (2000) found that men were more likely pathological users than females (cited in, Chou *et. al*., 2005). Also in this study statistically meaningful difference was found between male and female users and online game addiction. The results also showed that men used online games more than women.

On the other hand negative correlation was found between the daily duration of playing online games and online game addiction. Especially the fact of duration of daily online playing games was exactly inversely related to troubles faced by the students. This result shows that the students may not accept disruptions or ignore the experienced troubles. At the same time negative relations were found between online gaming with the satisfying feelings of success, achieve economic gains and online game addiction. Wan and Chiou (2006) have done a qualitative research of why adolescents in Taiwan are addicted to internet games. Most of the interviewees mentioned that life without online games was "dark" and "boring". The interviewees stated that playing online games was only for "sense of relief", "leisure activities", "whiling away from current time", "escape from reality", "to be relaxed", "to feel like he was still studying" and "the need for interpersonal relations". Also adolescents refer that playing online games was the focus of their life. These results somehow support the findings of the current study.

The present study focused on the high school students that use their own personal computer for playing online games and develop game addiction. As related with the findings, we are aware of the effects of online game addiction on gender differences. Only adolescents, who attend private high school and come from the families with higher socio-economic status and education, have participated in the study. Having a large sample of students with different backgrounds may enable to generalize the results to the population. The further studies could be applied to other age groups such as secondary or university students in order to obtain a variety of views on the issue.

Considering the results of this online gaming habits or addiction it is recommended to provide training to the students about the positive and negative aspects of online games. In addition, students having online gaming habits are suggested to develop awareness about troubles that come with addiction.

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An Investigation of University Students' Attention Levels in Real Classroom Settings with NeuroSky's MindWave Mobile (EEG) Device [1]

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Abstract

This study aims to test the possibility of multiple readings of students' attention levels in real classroom settings by means of NeuroSky's MindWave EEG device. The study in which measure system was considered in order to determine students' attention level in real classroom was designed by design based model. Within this research design, time-series experimental design was utilized to see the change in students' attention levels on stimuli given in an hour lesson by NeuroSky's MindWave Mobile device.

In study, pilot study was performed in 10 lesson hours with 42 sophomore students studying at elementary teaching at Uşak University. After the system' usability and obtaining the data, actual research lesson was conducted with sophomore students in two hours. Through NeuroSky's MindWave EEG device, the data obtained of time series analysis results were compared to video-recording images. In order to perform criterian validity of EEG data obtained by NeuroSky's MindWave EEG device, d2 test which is one of standart attention test was applied to students. As a result, correlation was computed by both measures [Kendall τ (tau) 0.41].

The findings indicated that powerpoint presentation, digital maps used in lesson increase students' attention levels, as lecture methods without any teaching material decrease their attetion levels. Consequently, that EEG data by NeuroSky MindWave device are associated positively with the data of "d2" test at middle level and that this device mesaures quantitatively students' attention levels, so it is said that the device can be used for multiple measures in real classroom.

Key Words: Architectures for educational technology system, Improving classroom teaching, Media in education; Post-secondary education.

Introduction

As a psychological structure, attention is a complex neural phenomenon in the mechanisms of the human brain (Dayan, Kakade, and Montague, 2000; Richards, 2005; Grossberg, 2005). Barkley (1988) describes attention as a multi-dimensional structure involving many links between external stimuli or work and behavioral reactions. Within this structure, dimensions and performances such as focused attention, selective attention, control, alertness, continuing

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attention, focus, stimulation, vigilance, interrupted attention, capacity, effort, attention direction, flexibility, attention fatigue, and attention diversion show the functions of attention (Zimmermann and Leclercq, 2002). A general definition of attention is that of the mind focusing on a given activity. This process of attention involves mental stimulation and selection. The mind prepares to capture incoming stimuli, and when they arrive, sorts and selects the appropriate ones among them (Öztürk, 1999).

The link between attention and learning can be detected by finding out whether learning has taken place regardless of a certain stimulus. A piece or pieces of information making their way to a student's consciousness without their realization may be indicative of covert learning. However, full learning does not take place unless information hidden in the memory is turned into performance (Senemoğlu, 2010). For this reason, further research is recommended in order to reveal any effects that attention may have on learning, especially in classroom settings. Theory of information processing claims that information first goes through attention and selective perception before its transfer to sensual recording, short-term memory, and long-term memory. This is why learning is said to commence with attention to external stimuli: due to innumerable external stimuli and the limited capacity of the memory, individuals only retain selected information that they pay attention to and that they consider important (Senemoğlu, 2010). Attention can therefore be claimed to be a prerequisite to learning (Schunk, 2009) and a factor that facilitates it (Kruschke, 2000; Schmidt, 2001).

A review of related literature reveals different methods and tests used to measure attention, which is a psychological and neurophysiological phenomenon. Cohen (1993), and Mahone and Schneider (2012) hold that clinical assessment of attention rests upon three sources of information: psychometric tests designed to measure other cognitive functions providing indirect information on attention (Öncü, Ölmez, and Şentürk, 2005), neurophysiological attention tests (Vinck, Mullart, Rotteveel, and Maassen, 2009), and direct observation and measurement of behaviour. In the tradition of the neurophysiological measurements of attention, *the Weschler Adult Intelligence Scale* (WAIS), applied first in the US and the UK, is considered to be a significant test (Ward, 2004). There is also work on measuring attention with the EEG technique for neurophysiological assessments based on individuals' brain signals (Mostow, Chang, and Nelson, 2011; Astaras, Moustakas, Athanasiou, and Gogoussis, 2013).There are few studies (Lindquist and McLean, 2011; Risko, Anderson, Sarwal, Engelhardt and Kingstone, 2013) on measuring attention conducted so far, especially, on detecting students' attention during learning in real classroom settings. This has been an incentive to plan a study of methodology that would allow multiple readings of attention

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levels. Real-time measurements of students' attention levels during learning in real classroom settings can be seen as an originality of the present study.

2.0. Research Goal

This study aims to test the possibility of multiple readings of students' attention levels during learning in real classroom settings by means of NeuroSky'sMindWave EEG device.

3.0. Research Design

The study in which measure system was considered in order to determine students' attention level in real classroom was designed by design based model. Design-based research, which blends empirical educational research with the theory-driven design of learning environments, is an significant methodology for understanding how, when, and why educational innovations work in practice (The Design-Based Research Collective, 2003).

The Time-Series Experimental Design was used to detect the time-dependent changes in students' attention levels depending on the stimuli. This time-series experimental model is used in longitudinal research to detect any time-dependent change that occurs in the dependent variable (Wiersma, 1985; Scott and Usher, 1999; Sümbüloğlu and Sümbüloğlu, 2007; Sönmez and Alacapınar, 2011; Büyüköztürk, Çakmak, Akgün, Karadeniz, and Demirel, 2012).

3.1. Study Group

The study group was composed of a total of 21 volunteers studying in their second years (21 students from each year) at Uşak University, Faculty of Education, Department of Classroom Teaching, in the autumn and spring terms of the 2013-2014 academic year.

3.2. Experimental Setup

Experimental setup consist three parts as computers, video camera and measurement devices. Computers are responsible to connect the measurement devices and record the incoming data with time stamp. Video camera is a handy cam for record the actions in the lesson. Measurement devices are mobile EEG headsets named as MindWave Mobile which measures brain waves. The experimental setup diagram is shown in Figure-1 and a application photo is shown in Figure-2.

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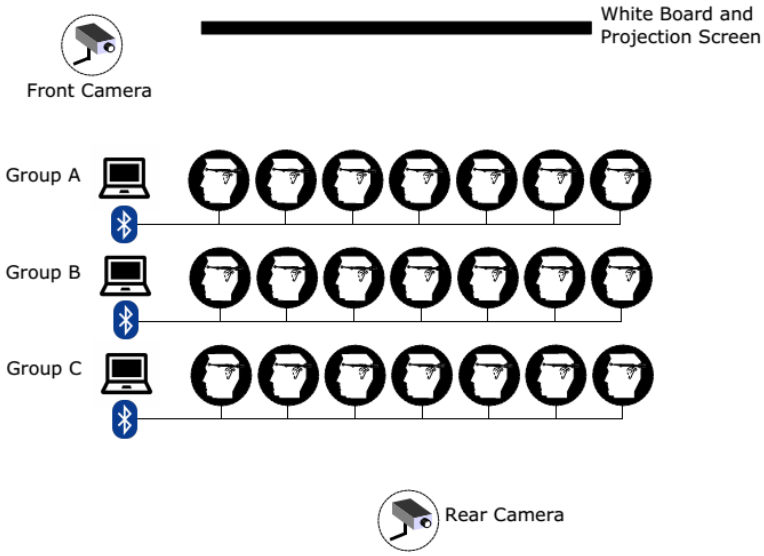


Figure-1: Experimental Setup Diagram



Figure-2: Experimental Application

3.3. Measurement Devices

NeuroSky's MindWave Mobile (EEG) device is a commerical EEG device. It was used for measuring brain waves, together with video recording equipment for synchronization with the stimuli. As this study looks only at the attention scores, NeuroSky's MindWave device was preferred to other multi-functional devices on the market.

NeuroSky's MindWave was developed directly as a biosensor to read the electric activities of the brain in detecting its states of attention and relaxation. EEG data is low-cost to obtain and easy to use. Attached onto the earlobes and the forehead, the caps serve as a voltmeter at microvolt level with the aid of electrodes and help obtain brain signals from neural activities. In this process, each activity state captured in an individual's brain activity is assigned a score

between 0 and 100 for attention and meditation values (Salabun, 2014; MindWave User Guide, 2009).

3.3.1. Measuring attention and meditation with Neurosky's Mindwave Mobile (EEG) device

Nerve cells carry out their tasks by moving the electro-chemicals on them. The electro-chemicals moved in this process cause a flow of electric charge and, consequently, a change of electric field. The EEG technique aims to study the time-dependent electric field changes in the brain nerves and to find out about the functioning of the brain without the need for surgical intervention.

Measurements with the EEG technique are as easy as those on any electric circuit with a voltmeter. Just as with the voltmeter, all it takes is to attach the two electrodes of the EEG device on the areas to be measured. The electrodes sense the electric changes in the nerve cells of these areas. These changes are at the microvolt level, which is why it would be impossible to obtain readings with ordinary voltmeters without amplification. For this reason, the brain signals obtained with the EEG devices are enhanced at a rate of about 10^6. However, along with the brain signals, this also causes the enhancement of unwanted noise and side effects, which are then weeded out through filtering. The device used in this study is adequately equipped for the filtering.

Research shows that brain waves have a frequency value between 0 and 100 Hz (Teplan, 2002; Marosi, Bazán, Yañez, Fernández, Rodriguez, Silva, and Reyes, 2002; Mostow, Chang, and Nelson, 2011). In order to understand the time-dependent changes in brain activities such as attention and meditation, a time-frequency analysis of the electric signals is needed. Brain waves between 0 and 100 Hz frequency intervalsare grouped into five basic bands (Delta (0-3.5 Hz), Theta (4-7 Hz), Alfa (8-12 Hz), Beta (13-30 Hz), and Gamma (>30 Hz)) in order to read into the brain activities (Salabun, 2014; Varada, Moolchandani, and Rohit, 2013; Yıldırım and Varol, 2013; MindWave User Guide, 2009). Table 1 below summarizes the behaviours that correspond to these frequency intervals (MindWave User Guide, 2009). The table shows direct correlation between frequency and brain activity. This may lead to the conclusion that the rise in frequency and width is directly linked to the repetition and flow amount of the electro-chemicals in the nerves in the unit time. For instance, with high neural activity, the nerve cells cause much triggering in the unit time and the signal frequency rises.

The device used in the study captures the brain waves in the Beta interval, produces an original value, and scales it between 1 and 100. In this scale, the results of the data analysis were evaluated with the manufacturer's e-Sense Metric. According to this metric, attention

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and meditation data is scaled between 1 and 100. According to the scale, natural state, or the floor, is between 40 and 60. 60 to 80 is slightly high and 80 to 100 is very high. Likewise, 20 to 40 is slightly low and 0 to 20 is very low. The low parts are due to extraordinary circumstances, attention deficit, and excitement (MindWave User Guide, 2009).

Type		Frequency (Hz)	Mental state and conditions
Delta		0- 3.5	Deep, dreamless sleep, non-REM sleep, unconscious
Theta		4 - 7	Intuitive, creative, recall, fantasy, imaginary, dream
Alpha		8 - 12	Relaxed, but not drowsy, tranquil, conscious
Beta	Low	13- 15	Formerly SMR, relaxed yet focused, integrated
	Mid.	16 – 20	Thinking, aware of self & surroundings
	High	21 - 30	Alertness, agitation
Gamma		>31	Motor functions

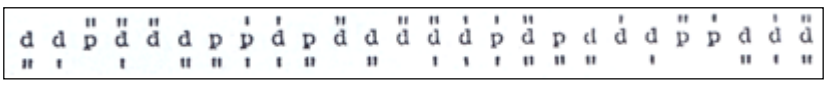
Table 1: EEG Bandwidth and Corresponding Mental State and Condition.

3.3.2. Reliability of the data collection instrument

In Rebolledo-Mendes, Dunwell, Martvnes-Miron, Vargas-Cerdan, de Freitas, Liarokapis ve Garcva-Gaona (2009)'s study which aims to assess the usability of NeuroSky's MindBuilder-EM (MB), they found consistent results about attention with EEG data through NeuroSky headsets. With two psychological tests, Crowley, Sliney, and Murphy (2010) tested the reliability of NeuroSky's Mindset headsets in measuring attention and meditation. They concluded that the data obtained from the headsets during the Stroop and Towers of Hanoi tests proved the suitability of NeuroSky's Mindset earphones in measuring users' attention and meditation levels.

3.3.3. Criterion-related validity

d2 attention test was used to perform the criterian validity of NeuroeSky Mindwave device to measure attention. d2 attention test was developed by Brickenkamp in 1962. It helps to measure selective attention, performance speed and mental concentration. The first section of test includes personal information and total performance values that participants obtained at test. It consists of 14 rows at which each of them comprises 47 letter series including "p" and "d". There are markers varying from 1 to 4 below or over these characters. The participant have to find "d" letter with two markers by ignoring irrelevant other letters at each row and scan them. They are asked to perform it for 20 s. A sample of test is shown at Figure-3.



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Figure-3: Example of letter series at test

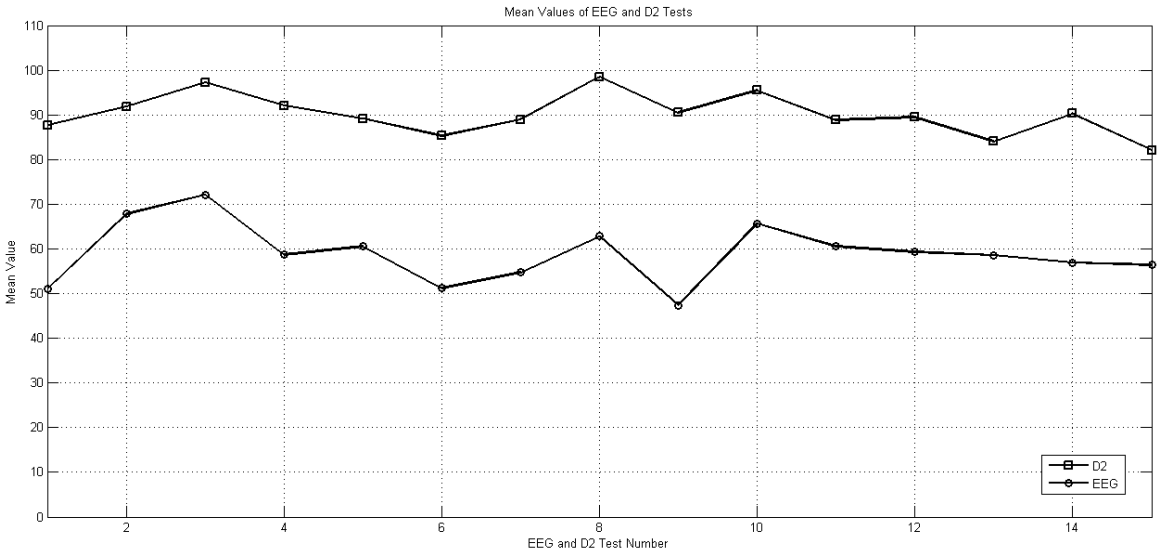


Figure-4: EEG and D2 Corelation

The participant was asked to perform simultaneously d2 attention test when their' heads were attached with NeuroSky Mindwave device. The data from NeuroSky Mindwave device were compared to performance scores that they obtained from the test. 20 participants took part in the study of performing criterian validity NeuroSky Mindwave device. But the data of five participants excluded due to the data from NeuroSky Mindwave are fractures and lack. So, we performed the correlation analysis with 15 participants' data. Correlation coeeficient (Kendall τ (tau)) was found as 0.41. Figure-4 shows the relation between EEG and d2 test corelation.

3.4. Conducting the study

The study was broadly conducted in two stages: the preparatory stage and the data collection stage.

3.4.1. . Preparatory Stage

The preparatory stage involved the synchronization of the device with the computers. MindWave Mobile devices (non-medical) developed by the NeuroSky firm as computer-human interface were used to take measurements for the reading of brain waves. The device has a single measurement probe and the signals are received via an electrode on the left side of the forehead. Filtering and enhancement are carried out by the ThinkGear card inside the MindWave Mobile device. This card can send both raw and filtered brain waves through frequency analysis. For ease of data analysis in our study, only attention and meditation data was obtained from the device. The ThinkGear card sends one attention and one meditation

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data per second. The MindWave Mobile device can be connected via Bluetooth to computers, iPads, and smartphones for wireless communication. As the Bluetooth technology uses 3 byte addressing named piconet so it allows active connection of a maximum of seven (2^3-1) slave devices to the main device (IEEE Standard for Information Technology, 2005).

The NeuroSky firm does not supply a program for multiple connections. For this reason, we write a code in Python programming language which collects data from seven slave device. In writing the program, the ThinkGear protocol was used to separate data packages. Each device was perceived as a serial port when the computer was identified, and, for this reason, the serial library was used in Python and the data was recorded on an Excel file.

This program allowed a computer to be connected to a maximum of seven devices. In our system set up in the classrooms, three separate computers were connected to 21 devices. Care was taken to form the groups separately (seven devices for each computer) in order to avoid interference in Bluetooth communication.

Following the preparatory stage, the applications were conducted in 2 class hours.

3.4.2. Data Collection Stage

Prior to this stage, the researchers first told the students about the use of the device. Once they put the devices on, the three computers were connected to 21 devices. On the other hand, video cameras were put up in the front and back of the classroom in order to establish the stimulus and time link when the data later had to be interpreted. It was assumed that the participating students were equally affected by the presence of the cameras and the NeuroSky MindWave Mobile device.

Following all these preparations, during two class hours, research lesson was performed using teaching material previously by instructor

3.5. Data analysis

NeuroSky's MindWave Mobile device sends the attention and meditation data to be used in time analyses to the computer with 1 Hz frequency. The attention and meditation values are obtained through frequency analyses on the raw electric signals inside the device (MindWave User Guide, 2009). During collection, the data was separately recorded for the attention, meditation, time, and person/device parameters. The data was studied before being analysed, and it turned out that interruptions had occurred in the data of four first-year and seven second-year students due to the electrodes coming off. For this reason, full data from 17 first-year students and 14 second-year students was put to analysis.

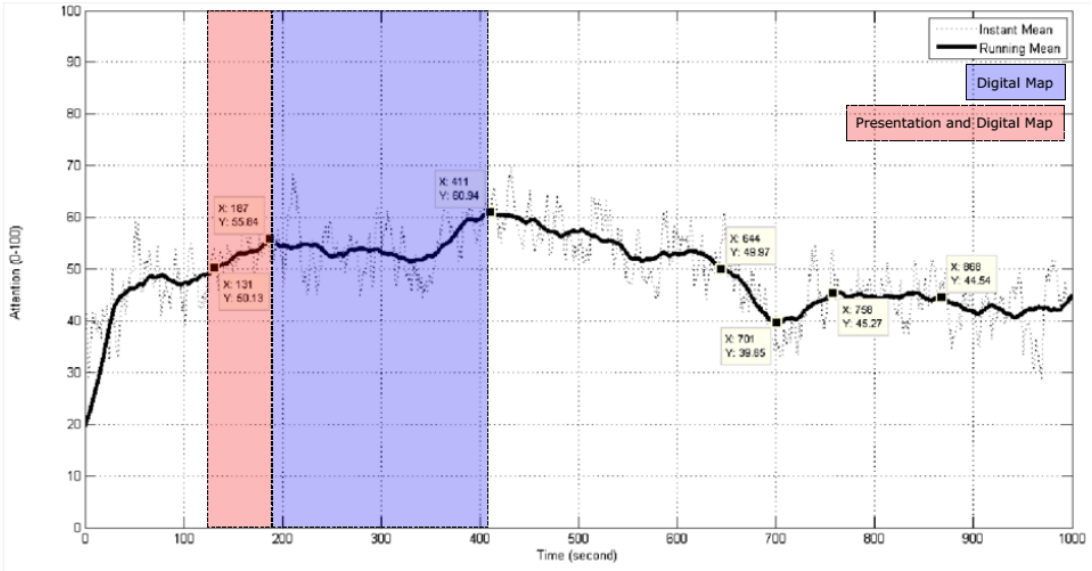
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The video recordings were watched to determine the stimulus-time periods for the data obtained and the time points for these periods were found. The data was analyzed through the Python program using means of 10, 60, and 120 seconds.

The results of the data analysis were evaluated using the manufacturer's e-Sense Metric. According to this metric, attention and meditation data is scaled between 1 and 100. According to the scale, natural state, or the floor, is between 40 and 60. 60 to 80 is slightly high and 80 to 100 is very high. Likewise, 20 to 40 is slightly low and 0 to 20 is very low. The low parts are due to extraordinary circumstances, attention deficit, and excitement (MindWave User Guide, 2009).

4.0. Findings

This section presents figures and interpretations of the 60-second general means of the two classes for the second-year students. Graph-1 shows the results of the analysis of the first class held with second-year students.



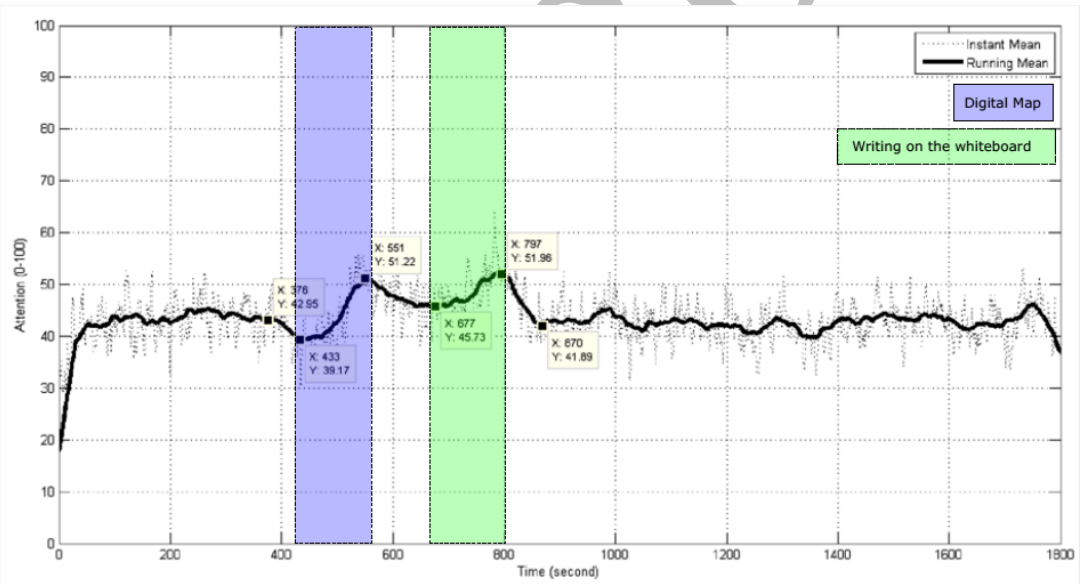
Graph 1. 60-Second Means for 14 Students for Class One, Year Two

The graph reveals that the first point where the students' attention levels average passes 50 units corresponds to the second minute of the class, and that their attention levels display an increase of 5.71, or 10%, from this minute up to the third. The video recordings show that, in those minutes, the lecturer was making a Power Point presentation with a digital map projected onto the board, and that he was standing next to the map and pointing at it. It could be interpreted that digital maps used in geography classes attract students' attention. Plain lecturing from the start of the class up to minute two, followed by the projection of the digital map as a different stimulus, can be seen as corroborating this finding.

The video recordings show that, from the third minute of the class up to the seventh, the lecturer continued plain lecturing while the digital map was still projected on the board. The figure shows the students' attention levels between 50.13 and 60.94 units in those minutes. When the attention levels reached 60.94 units (the seventh minute), it was seen that the lecturer removed the digital map, went online, and projected a map showing daily meteorological events while explaining and pointing at it. After that, the lecturer removed the projection of the map and continued with plain lecturing for about four minutes. The attention levels then slowly fell from 60.94 units to 49.97, or by 16%. This could be interpreted as plain lecturing being unconducive to keeping the students' attention levels afloat.

The fall went on, with the lowest level of 39.65 reached between minutes 11 and 12. The attention levels showed an increase of 5.62 units after minute 12 and reached 45.27 units in minute 13, after which they kept steady between 40 and 50 until the end of the class. The findings from class two, year two, are shown in Grapg-2.

Graph 2 shows the results of the analysis of the first class held with second-year students.



Graph 2. 60-Second Means for 14 Students for Class Two, Year Two

Figure-6 shows that the students' attention level averages kept between 40 and 50 units for 30 minutes throughout the class. The video recordings were consulted to explain the exceptional increases above 50 units in two instances. The lowest level of 39.17 units in minute 7 shot up to 51.22 in minute 9 – in those two minutes, the lecturer was seen to project a map on the board with moving pointers. After this point (corresponding to minute 9), the lecturer started plain lecturing of a subject other than the map on the board, and, by minute 11, the attention levels had already fallen to 45.73.

Two minutes passed before the average of the students' attention levels started to rise again to a new high. Between minutes 11 and 13, the lecturer was seen to be writing on the board and illustrating the subject with examples from daily life.

5.0. Conclusion

The findings from the study being in line with the attention measurement values quoted in the manufacturer's e-Sense Metric can be seen as proof that multiple readings can be done by means of NeuroSky's MindWave EEG device, as the values between 40 and 60, described as normal attention levels in the e-Sense Metric, were found to overlap with the class average values yielded by the study data. This is also corroborated by the rise in the students' attention levels in the presence of different stimuli. That the data from the device reflects the students' attention levels is further evidenced by the video recordings revealing that the drops in the students' attention levels are due to extraordinary feelings such as excitement.

The PowerPoint presentations in applied courses were found to increase students' attention levels. This supports the conclusion by Yang, Chang, Chien, Chien, and Tseng (2013) that PowerPoint presentations raise students' attention levels. Likewise, our finding that the Internet use in the classroom increases students' attention levels is parallel to the conclusions by Schmidt and Vandewater (2008). Rieber (1991) studied the effects of animation and graphs on students' attention levels and found that they both caused an increase but that the former had more significant effects than the latter. The rise in students' attention levels observed in our study during the use of graphs is a similar finding to Rieber's (1991). Navarro, Ruiz, Alcalde, Marchena, and Aguilar (2001), Navarro, Marchena, Alcalde, Ruiz, Liorens, and Aguilar (2003), Rabiner, Murray, Skinner, and Malone (2010), Murray and Rabiner (2014) conclude that computer-aided teaching raises students' attention levels, which is similar to our findings.

In conclusion, the finding that the students' attention levels are affected by the use of different materials in applied courses (Power Point, the Internet, digital maps, graphs), methods (computer-aided teaching vs plain lecturing), and stimuli (the class being interrupted by a new comer or conversations about daily life) is further evidence that multiple readings can be done in real classroom settings with NeuroSky's MindWave EEG device.

The use of the device is considered to be helpful in deciding on the equipment and methods to be used in educational settings, determining the better forms of lecture, teacher-training, and designing classrooms.

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Artırılmış Gerçeklik Uygulamasının Geliştirilmesi Ve Uygulanması: Geometri Örneği

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Özet
Eğitim ortamları için büyük potansiyele sahip olduğu düşünülen artırılmış gerçeklik uygulamalarının, bu ortamlara entegrasyonunda bazı sorunlar yaşanmaktadır. Gerekli yazılımların ve donanımların seçimi için ihtiyaç duyulan teknik bilgi eksikliği ve bu ortamların geliştirilmesine ilişkin adımları sunan örnek uygulamaların azlığı, bu zorlukların başında gelmektedir. Bu araştırmada artırılmış gerçeklik ortamının geliştirilmesi için optimum yöntem ve tekniklerin seçilmesine dikkat edilerek alandaki bu eksikliğin giderilmesi hedeflenmektedir. Ortamının tasarım aşamalarının ve uygulama sürecinde elde edilen deneyim ve verilerin paylaşıldığı bu çalışmanın artırılmış gerçeklik ortamlarını üretmek ve kullanmak isteyen araştırmacılara ve eğitimcilere faydalı olacağı düşünülmektedir.

Giriş

Eğitim ortamlarında karşılaşılan problemleri gidermek ve öğrenme sürecinin verimliliğini artırmak için arayışlar her dönemde devam ederken, sınıflarda kullanılan teknolojiler de bu ihtiyaca paralel olarak değişiklik göstermektedir. Radyo ile başlayıp televizyon, projeksiyon, bilgisayar, akıllı tahta ve tabletler ile gelişimine devam eden bu teknolojilerin eğitim-öğretim ortamlarına entegrasyonunda bazı sorunlar yaşanabilmektedir (Bauer ve Kenton, 2005; Chen, 2008; Butler ve Sellbom, 2002; McDermott ve Murray, 2000). Pelgrum (2001) bu sorunları, uygun yazılımların eksikliği ve yeterince uzman/teknik desteğin sağlanmaması olarak belirtmektedir. Ertmer (2005) ise entegrasyonun birinci problemi olarak eğitimsel ve teknik destek eksikliğini göstermiş ve bu problemin öğretmenlere ihtiyaçları doğrultusunda materyal sağlanarak giderilebileceğini ifade etmiştir. Çakır ve Yıldırım (2009) da öğretim ortamlarına teknoloji entegrasyonu ile ilgili bilgisayar öğretmenlerinden görüş aldıkları çalışmalarında, uygun yazılımların eksikliği ile sorunlar yaşandığına dair benzer verilere ulaşmışlardır.

Artırılmış gerçeklik (AG) uygulamaları ilk olarak 1960'lı yıllarda endüstride, askeri alanlarda ve sağlık sektöründe kullanılmaya başlanmış, üretim teknolojisinin ucuzlaması ile kullanımı yaygınlaşmıştır. Son yıllarda eğitim alanında da kullanımına yönelik çabalar gözlenmektedir (Somyürek,2014). Bu uygulamalar gerçek dünya nesneleri üzerine bilgisayar ortamında geliştirilen üç boyutlu materyallerin bütünleştirilmesini mümkün kılmaktadır. Böylece gerçek dünyadan uzaklaşmadan, sanal görüntünün etrafında her açıdan gözlem

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yapılabilmektedir. Kişiyi içine alan, gerçeklikten soyutlanmadan cisimlere dokunma, etrafında dönme gibi iletişim kanallarını destekleyen, aktif anlık etkileşimler sunan özellikleri sayesinde AG uygulamalarının eğitim ortamları için büyük bir potansiyele sahip olduğu düşünülmektedir. Yapılan araştırmaların sonuçları da bu düşünceyi destekler niteliktedir (Billinghurst, Kato ve Poupyrev, 2001; Dünser, Steinbügl, Kaufmann ve Glück, 2006; Shelton, 2003; Wojciechowski ve Cellary, 2013; Klopfer ve Squire,2008; Zhou, Cheok ve Pan, 2004).

Bu çalışmada matematik dersi kapsamında yer alan "üç boyutlu cisimler ve hacim ölçme" konusu, oluşturulan AG materyalleri ile desteklenmiştir. Bu konu hakkında öğrencilerin kavramakta güçlük çektikleri gerek literatür incelendiğinde gerekse branş öğretmenlerinin görüşü alındığında ortaya çıkmaktadır (Nizamoğlu, Yılmaz ve Keşan, 2000; İncikabı ve Kılıç, 2013; Kurtuluş ve Yolcu, 2013). Piaget (1976) bu soruna gerekçe olarak katı cisimler konusunun işlendiği dönemde öğrencilerin somut işlemler döneminden soyut işlemler dönemine geçiş sürecinde yer almalarını göstermektedir. Bazı araştırmalar ise bu kavramların anlatımında iki boyutlu çizimlerin ders materyali olarak kullanılmasının, öğrencilerin üç boyutlu bu nesneleri anlamlandırmaları için yetersiz kaldığını vurgulamaktadır (İbili, 2013). AG teknolojilerinin yapısı gereği sahip olduğu gerçek yaşamdan uzaklaşmayan, etkileşimli ve üç boyut özelliklerinin katı cisimler konusunda yaşanan problemlere çözüm sunabileceği düşünülmektedir.

Mevcut teknolojilerde olduğu gibi AG uygulamalarının eğitime entegrasyonunda, 3 boyutlu nesnelerin oluşturulması ve teknik bilgi eksikliği gibi sorunlar yaşanmaktadır(Yuen, Yaoyuneyong ve Johnson, 2011). Bu nedenle AG ortamının tasarımında asgari teknik bilgi ve beceri gerektiren yöntemler seçilmiştir. Böylelikle çalışmanın farklı branşlarda faaliyet gösteren araştırmacılar ve eğitimcilerin ihtiyaç duydukları AG materyallerini üretebilmeleri noktasında faydalı olabileceği düşünülmektedir. Ayrıca bu çalışma için geliştirilen AG materyalinin gerçek sınıf ortamında kullanılmasından elde edilecek bilgi ve deneyimlerin, bu teknolojiyi derslerinde kullanmak isteyenlere örnek teşkil etmesi amaçlanmaktadır.

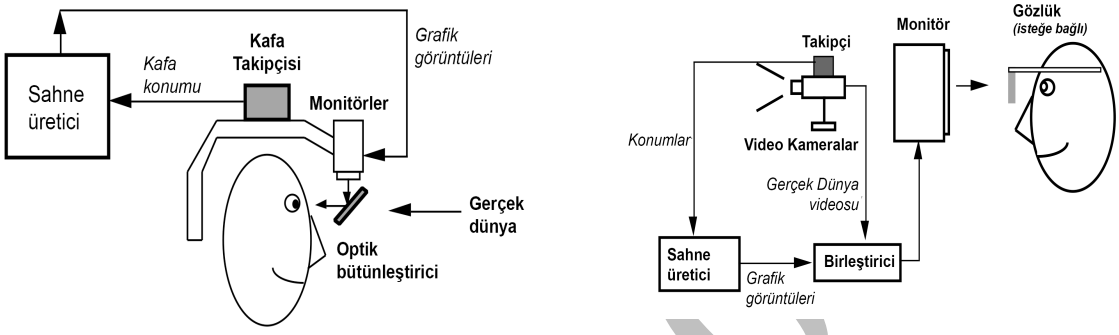
İlgili literatür

Artırılmış gerçeklik sanal nesnelerin gerçek ortamlara entegre edilmesi ile gerçekliğin zenginleştirilmesini sağlayan teknolojiler olarak tanımlanmaktadır (Martin-Gutierrez, Navarro ve Gonzalez, 2011; Gonzato, Arcila ve Crespin, 2008). Artırılmış gerçeklik ortamlarında

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bulunması gereken üç temel özellik vardır. Bu özellikler: 1)Bilgisayar tarafından oluşturulan nesnelerin, çevredeki gerçek nesnelerle beraber algılanması gereklidir. 2)Eş zamanlı olarak ortama veri ekleyebilmeli, değişiklik yapılabilmelidir. 3)Sanal içeriğin, gerçek ortamda uygun yerde ve üç boyutlu pozisyonda işlenmesi gereklidir (Azuma, 1997).

Artırılmış gerçeklik görüntüleme sistemleri optik ve video tabanlı olmak üzere iki gruba ayrılmaktadır. Optik tabanlı sistemler, gerçek dünya görüntüsü ile sanal verileri kullanıcıların



takabildiği teknolojiler aracılığıyla birleştirmektedir. Video tabanlı sistemler ise, video kameralar aracılığıyla alınan gerçek dünya görüntülerini sanal veriler ile bilgisayar veya mobil cihazların ekranlarında birleştirmektedir. İki sistem arasındaki fark şekil 1'de gösterilmektedir.

Şekil 1: Optik tabanlı AG görüntüleme sistemi ve Video temelli AG görüntüleme sistemi (Azuma,1997)

Sanal ve gerçeğin birleştirildiği ortamın yanı sıra sanal verilerin oluşmasında kullanılan uyarıcılara göre de AG uygulamalarını sınıflandırmak mümkündür. Bunlar konum tabanlı ve resim tabanlı olmak üzere iki kategoriye ayrılmaktadır. Konum tabanlı sistemlerde, sanal verilerin oluşması için kullanıcıların bulundukları konum bilgisi kullanılırken, resim tabanlı sistemlerde daha önceden hazırlanmış işaretçiler veya ortamda bulunan fiziksel nesnelerin algılanması gerekmektedir.

Bu araştırmada işaretçilerin web kameraları ile algılandığı, işaretçiler ile eşlenmiş sanal 3 boyutlu görüntülerin bilgisayar ekranında birleştirildiği, video/resim tabanlı bir AG uygulaması geliştirilmiştir.

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AG uygulamaların kullanımının eğitim ortamlarında yaygınlaştırılabilmesi için materyal oluşturulmasının kolaylığı büyük önem arz etmektedir. Bu uygulamaların oluşturulmasında Layar, Metaio, D'Fusion, Webtitude, Zugara, Daqri, Aurasma, Stiktu, Onvert, Blippar, ARToolkit gibi farklı yazılımlar kullanılmaktadır. Metaio, Aurasma, Stiktu gibi bazı arayüzlerin kullanılması basit ve teknik bilgi gereksinimi azken, ARToolkit, Webtitude gibi yazılımların kullanımı daha karmaşıktır ve teknik bilgi gereksinimi fazladır. Yapılan literatür taramasında AG uygulamalarının geliştirilmesinde kullanılan tekniklere/teknolojilere odaklanılmış, araştırmacıların bazılarının, MetaioCreator (Küçük, Yılmaz, Baydaş ve Göktaş, 2014;), Aurasma (Atherton, Javed, Webster ve Hemington-Gorse, 2013; Navarro, Galindo ve Fonseca, 2013), ARToolkit (Do ve Lee, 2009; Shelton ve Hedley, 2002) yazılımlarını kullanarak AG materyallerini hazırladıkları belirlenmiştir. Ancak bu ortamların geliştirme sürecini adım adım anlatan herhangi bir çalışmaya rastlanmamıştır. Ayrıca AG ortamlarının uygulama süreci ve bu süreçte yaşanan deneyimleri paylaşan çalışmaların eksikliği de dikkat çekicidir.

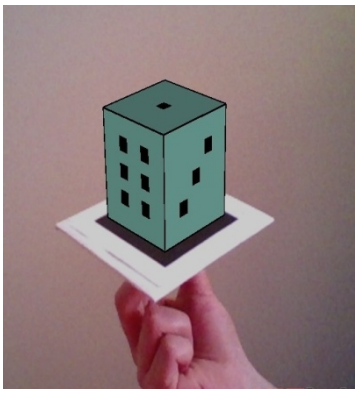
Artirilmiş gerçeklik uygulamasinin geliştirilmesi

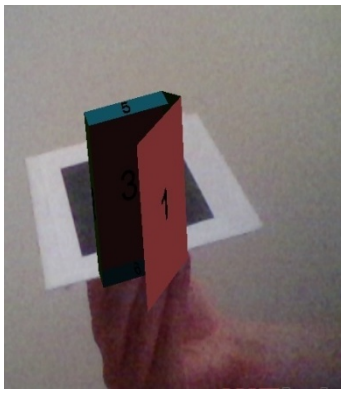
"Üç boyutlu katı cisimler ve hacim ölçme" konusunun anlatımını desteklemek amacıyla oluşturulan AG ortamının tasarım aşamaları, üç boyutlu nesnelerin oluşturulması ve bu nesnelerin işaretçilerle ilişkilendirilmesi aşamalarından oluşmaktadır.

Üç Boyutlu Nesnelerin Oluşturulması

Üç boyutlu nesnelerin çizim ve animasyonları Autodesk 3ds Max yazılımı ile oluşturulmuştur. Şekil 2'de sabit bir model görülmektedir. Bu model üç boyutludur, işaretçinin hareketleri ile döndürülebilmekte, büyütülüp küçültülebilmektedir. Şekil 3'te ise işaretçinin hareketlerine göre etkileşime girmesinin yanı sıra, kendi içinde de bir animasyonu barındıran örnek materyal görülmektedir. Modellerin uygunluğunu belirlemek için, araştırmacılar tarafından bir uzman formu geliştirilmiştir. Uzman formunu ilköğretim matematik eğitimi alanında 3 öğretim elemanı ve 5 matematik öğretmeni doldurmuş, bunun yanı sıra araştırmacılar yine aynı uzmanlarla yüz yüze görüşmeler gerçekleştirmiştir. Görüşmeler ve uzman formları ile elde edilen uyarılar ve öneriler dikkate alınarak, geliştirilen üç boyutlu materyaller üzerinde düzeltmeler yapılmış ve materyallere son hali verilmiştir.

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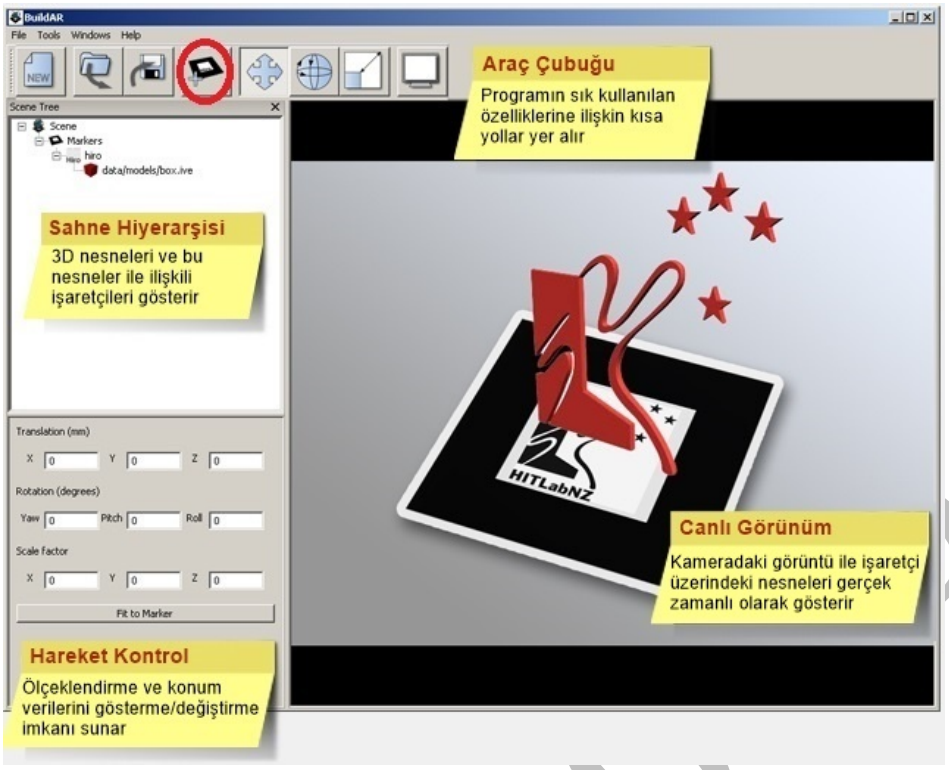
Şekil 2: Sabit model **Şekil 3:** Animasyon içeren model

Son hali verilen nesneler ile işaretçilerin ilişkilendirilmesi için kullanılan yazılımın desteklediği uzantılar; .3ds, .lwo, .obj, .stl, .flt, .ive ve .osg'dir. Bu nedenle her nesne Autodesk 3ds Max'eOSGExp plugin kurularak hareketli içeriklerin de kaydedilebileceği .osg uzantılı dosyalara dönüştürülmüştür. Bahsedilen eklentiye yazılımın resmi sayfasından ulaşılmıştır.

Üç Boyutlu Nesnelerin İşaretçilerle İlişkilendirilmesi

Üç boyutlu çizimler ve işaretçileri ilişkilendirmek için BuildAR programı kullanılmıştır. Programın arayüzü şekil 4'te görülmektedir. Program teknik bilgi gerektirmeyen sade bir arayüze sahip olmasının yanı sıra işaretçilerin oluşturulmasına da imkan sağlamaktadır.

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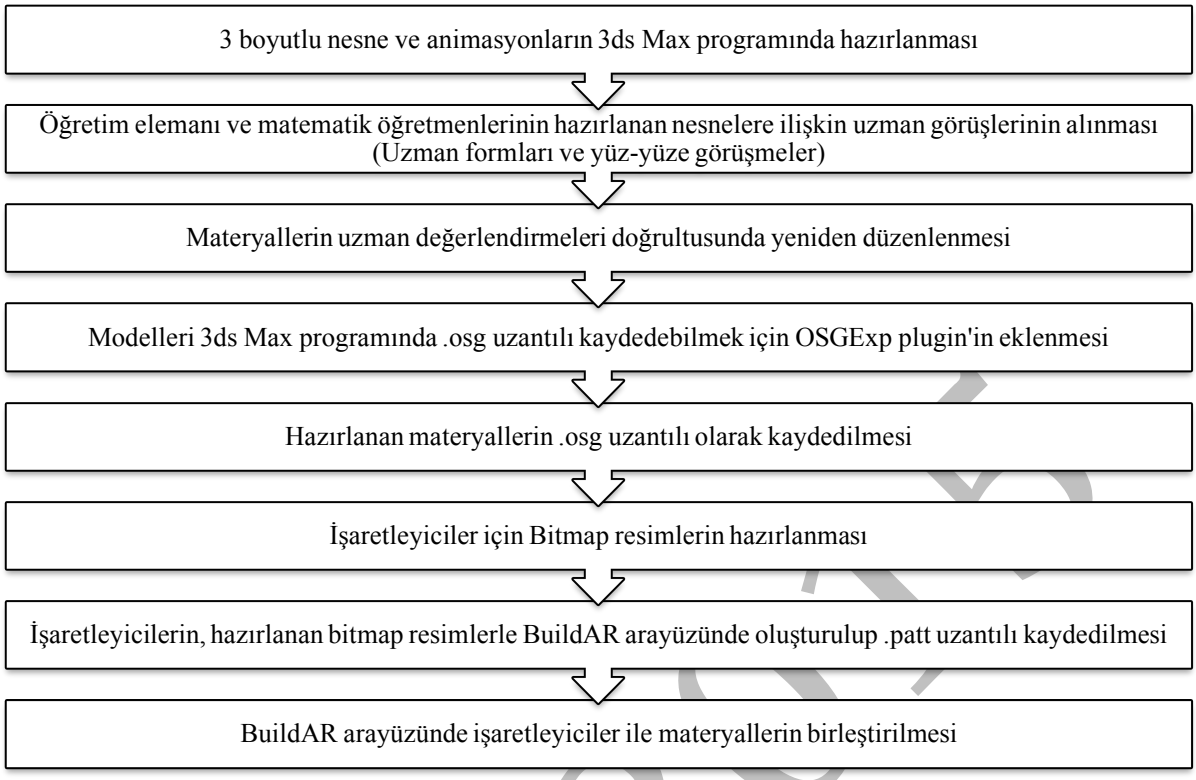
Şekil 4: BuildAR programının arayüz görüntüsü

İşaretçiler BuildAR programında oluşturulmuştur. Kullanılacak görsellerin formatı Bitmap olmalıdır. Bu nedenle boyutları önemli olmayan 1'den başlayarak numaraların verildiği .bmp uzantılı görseller oluşturulmuştur. Menü çubuğunda yer alan "Tools" / "Generate pattern" seçeneğinde "Canlı Görünüm" bölümündeki işaretçide görüldüğü gibi hazır çerçeveler bulunmaktadır. Hazırlanan görseller buradaki çerçeveler ile birleştirilmiştir ve işaretçiler .patt uzantılı olarak kaydedilmiştir.

Hazırlanan .osg uzantılı üç boyutlu materyaller ile .patt uzantılı işaretçiler BuildAR arayüzünde birleştirilmiştir. Yazılım ilk açıldığında "Sahne Hiyerarşisi" bölümünde "box.ive" üç boyutlu nesnesinin "hiro" işaretçisi ile ilişkilendirildiği görülmektedir. İstenilen nesneler ile istenilen işaretçiler buradan üzerine tıklayarak yeniden ilişkilendirilebilmektedir. Yeni işaretçi eklemek için ise şekil 4'te yuvarlak içinde gösterilen buton kullanılmaktadır. Yine eklenen işaretçi ile ilk olarak "box.ive" nesnesi ilişkilendirilmektedir. Materyallerin hazırlanma ve BuildAR arayüzü ile birleştirilme süreci Şekil 5'de özetlenmektedir

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Şekil 5: Öğretim materyallerinin hazırlanma ve BuildAR arayüzü ile birleştirilme süreci

Artırılmış Gerçeklik Ortamının Geometri Dersinde Uygulanması

Uygulama sürecinde gerçekleşenler, işaretçilerdeki kodun ve işaretçi konumlarının kamera ile sürekli taranması, taranan verilerin bilgisayarda yüklü olan BuildAR yazılımına aktarılması ve yazılımın bu verileri kullanarak üç boyutlu modeli bilgisayar ekranında oluşturması şeklinde ifade edilebilir. Dolayısıyla sistemin çalışması için web kamerası bulunan bilgisayarlara ihtiyaç duyulmaktadır. Bu nedenle çalışma bilgisayar laboratuvarında gerçekleştirilmiştir. BuildAR yazılımının sistem gereksinimlerinin oldukça düşük olması, bu yazılım ile üretilen AG uygulamalarının pek çok bilgisayar laboratuvarında kullanılmasını mümkün hale getirmektedir. Çalışmanın gerçekleştirildiği laboratuvardaki bilgisayarların özellikleri tablo 1'de sunulmaktadır.

Tablo 1:Çalışmanın gerçekleştirildiği laboratuvardaki bilgisayarların özellikleri

İşletim Sistemi	Windows XP
İşlemci	Celeron 3.33GHz
Ram Bellek	512MB
Ekran Kartı	128 MB
BuildAR Versiyonu	BuildAR 2008 (Ücretsiz Versiyon
WebCam	Everest SC-301

BuildAR programının tam sürümü ücretlidir. Ücretsiz sürümünün yalnızca kaydetme özelliği pasiftir. Bu sürümü kullanan araştırmacılar her uygulama öncesinde işaretçiler ile üç boyutlu nesneleri ilişkilendirmek zorundadır. Ücretli sürümünü kullanacak araştırmacıların işaretçiler ile nesneleri bir kez eşleştirmeleri yeterlidir.

AG uygulamalarına başlamadan önce, sistemin öğrenci ve öğretmenlere tanıtılması, uygulama esnasında çıkabilecek aksaklıkların önceden tespit edilebilmesi ve düzeltilebilmesi için pilot çalışma gerçekleştirilmiştir. Bu uygulama esnasında karşılaşılan sorunlar ve bu sorunları çözmek için üretilen çözüm yolları şöyle özetlenebilir:

- Bir bilgisayarları iki veya daha fazla öğrencinin birlikte kullanmasından dolayı öğrenciler arasında zaman zaman tartışmaların yaşandığı gözlenmiştir. Bu sorunun çözümü için öğrencilerin mümkün olduğunca yalnız çalışmalarına fırsat yaratılmıştır. Öğrencilerin bilgisayarı sırayla kullanmaları sağlanmış, laboratuvarda bulunan bilgisayarların tümü çalışır hale getirilmiş ve ek bilgisayarların bulunmasına çalışılmıştır.
- Bilgisayarların etkili ve verimli çalışmalarının önünde engel teşkil eden sistem ayarlarının değiştirilmesi sorununu çözmek amacıyla tüm bilgisayarlara DeepFreeze programı kurulmuştur. Bu sayede öğrencilerin bilgisayarları her açtığında aynı ayarlar ve özelliklerle karşılaşmaları sağlanmıştır.
- Uygulama esnasında kullanılan kameraların işaretçilere odaklanmalarına ilişkin sorunlarla karşılaşılmıştır. Bu sorunların önüne geçebilmek için uygulama öncesinde kameraların netlikleri ve odakları her seferinde kontrol edilmiştir.
- Yaşanan bir diğer sorun ise, kamera konumlarının ayarlanması aşamasında öğrencilerin zorluk çekmeleridir. Bu durumunun öğrencilerin derse odaklanmasına engel olduğu ve bunun yanı sıra vakit kaybına da sebep olduğu gözlenmiştir. Bu sorunun çözümü için kameraların konumları işaretçileri en iyi görecek şekilde araştırmacı tarafından sabitlenmiştir.
- Ortamdaki ışık miktarından dolayı işaretçilerin parlaması ve kameraların işaretçileri algılamakta güçlük çekmesi uygulamada yaşanan önemli problemlerden bir diğeridir.

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Laboratuvardaki ışık miktarını uygun seviyeye getirmek için koyu renkli perdeler takılarak parlamaların önüne geçilerek algılama problemine çözüm üretilmiştir.

- Öğrencilerin işaretçileri tutarken parmaklarının şeklin üzerine gelmesinden dolayı işaretçinin okunmasında problemler yaşanmıştır. Bunun yanı sıra öğrencilerin işaretçileri 360 derece döndürürken zorlandıkları gözlenmiştir. Öğrencilerin işaretçileri tutarken parmaklarının şekilleri kapatmasını önlemek ve üç boyutlu nesneleri döndürmelerini kolaylaştırmak için işaretçilerin altına çubuklar takılmıştır.
- İşaretçilerin yer aldığı kağıtların eğilmesi, kameraların işaretçileri algılamasını zorlaştırmıştır. İşaretleyicilerin basılı olduğu kağıtların eğilmesini engellenmek için işaretçiler kalın kartonlara yapıştırılmıştır.
- Ortamdaki ışık miktarından bağımsız olarak, bazı işaretçilerin kameralar tarafından algılanmasında zorluklar yaşandığı gözlenmiştir. Sorunun sebebinin bazı işaretçilerin çıktılarının diğerlerinden daha silik olmasından kaynaklandığı anlaşılmıştır. Bu sebeple tüm işaretçilerin koyu renkli olmasına dikkat edilmiştir.
- Uygulamanın yapıldığı sınıfın E tipi oturma düzenine sahip olması ve bilgisayarlar arası mesafelerin yeterli olmaması nedeniyle, öğrencilerin işaretçileri rahat hareket ettiremedikleri gözlenmiştir. Bu sorunun çözümü için oturma düzeni E tipinden U tipine dönüştürülmüştür. Böylece öğrencilerin işaretçileri rahat hareket ettirebilmeleri sağlanmıştır.

Yapılan düzenlemeler sonrasında uygulamanın yapıldığı ortama ilişkin görüntüler şekil 6'da yer almaktadır.

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Şekil 6: Çalışmanın yapıldığı ortama ilişkin görüntüler

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Tartişma ve sonuç

Son yıllarda, artırılmış gerçeklik uygulamalarının eğitim ortamlarında kullanımını ve öğrenenler üzerindeki etkilerini inceleyen araştırmalar dikkat çekmektedir. AG uygulamalarının eğitim ortamlarını zenginleştirme (Dunleavy, Dede ve Mitchell, 2009; Majoros ve Neumann, 2001; Yuen, Yaoyuneyong ve Johnson, 2011), öğrenme ile ilgili yaşanan sorunlara çözüm üretme (Shelton ve Hedley, 2002; Kaufmann ve Schmalstieg, 2003), öğrenme ve motivasyonu pozitif etkileme (Klopfer ve Squire, 2008; Wojciechowski ve Cellary, 2013) potansiyelinin olması ve aynı zamanda göreceli olarak yeni bir teknoloji olması, araştırmaların bu konuda yoğunlaşmasına neden olmaktadır. Ancak diğer teknolojilerin entegrasyonu sürecinde yaşandığı gibi AG uygulamalarının eğitim ortamlarına entegrasyonunda da bazı sorunlar yaşanmaktadır. Bu sorunlardan biri, AG ortamlarının geliştirilmesi için donanımsal ve yazılımsal teknik bilgi eksikliği, bir diğeri ise bu ortamların geliştirilme maliyetinin yüksekliğidir. Teknolojinin ucuzlaması ve yaygınlaşması ile birlikte pek çok eğitim kurumu bilgisayarlarla donatılmıştır. Hali hazırda çalışan bilgisayarlara, donanımsal olarak web kameraların, yazılımsal olarak ise ücretsiz uygulamaların kurulumu, AG uygulamaları için maliyet sorununun kolayca aşılmasını sağlayacaktır. Teknik bilgi eksikliği ile ilgili sorunun aşılması için ise AG uygulamalarının geliştirilmesi ve eğitim ortamlarında uygulanmasına ilişkin kılavuzlayıcı çalışmalara ihtiyaç duyulmaktadır. Literatür incelendiğinde, bu ihtiyaca cevap veren herhangi bir çalışmaya rastlanmamıştır. Bu araştırma, literatürdeki bu eksikliği gidermeyi hedeflemektedir. Ayrıca bu çalışmada, AG

uygulamalarının geliştirme sürecinde optimum zaman, çaba ve maliyet isteyen yöntemlerin seçimine özen gösterilmiştir. Böylece, bu uygulamaların yaygınlaştırılmasına katkı sağlayacağı düşünülmektedir.

Araştırmada web kamera maliyeti gözlük maliyetinden uygun olduğu için, video-resim temelli AG ortamının tasarlanması tercih edilmiştir. 3 boyutlu nesnelerin çizimi için 3dsMax programı seçilmiştir. Program, kullanımının yaygın oluşu ve endüstri standardı olmasının yanı sıra kapsamlı 3 boyutlu materyal kütüphanesine ücretsiz bir şekilde ulaşma imkanı sunmasından dolayı tercih edilmiştir. Oluşturulan üç boyutlu nesneler ile işaretçileri birleştiren pek çok AG yazılımı bulunmaktadır. Arayüz kolaylığı, ücretsiz oluşu ve internet bağlantısına ihtiyaç duymadan çalışması göz önünde bulundurularak BuildAR programının kullanılmasının uygun olacağına karar verilmiştir.

Çalışmada AG ortamının geliştirilmesi için gereken optimum yöntemlerin seçilip bunların adım adım açıklanmasının yanı sıra AG uygulamalarının eğitim ortamında uygulanmasından elde edilen deneyimler de paylaşılmıştır. Öncelikle bir pilot çalışma ve ardından geometri dersi kapsamında geliştirilen AG ortamı olmak üzere uygulama toplam 5 hafta boyunca sürmüştür. Araştırmacıların gözlemleri ve öğretmen-öğrenciler ile yapılan görüşmeler ile AG ortamının nasıl olması gerektiğine ilişkin önemli bulgular ulaşılmıştır. Bu bulgulardan bazıları, ortamdaki ışık miktarının kontrol altına alınması, öğrenci oturma düzeninin ve öğrenciler arasındaki mesafenin planlanması, kullanılan işaretçilerin kamera tarafından algılanabilir ve öğrenciler tarafından hareket ettirilebilir olmasıdır. İbili (2013) de çalışmasında AG uygulamaları ile yürütülecek derslerde dikkat edilmesi gereken bazı hususlara değinmiştir. Bunlar, fazla ortam ışığının kontrol altına alınması, benzer işaretçilerin kullanılmaması, işaretçilerin siyah beyaz ve harekete elverişli olacak şekilde tasarlanması şeklinde belirtilmektedir. İki çalışmada da benzer önerilerin yer alması, ileride AG uygulamalarının kullanılacağı çalışmalarda bu önerilerin dikkate alınmasının ne denli önemli olacağını göstermektedir.

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Assessıng Elt Pre-Servıce Teachers Vıa Web 2.0 Tools: Perceptıons Toward Tradıtıonal, Onlıne And Alternatıve Assessment

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Abstract

The purpose of this study is to investigate the perceptions of the ELT pre-service teachers toward the traditional, alternative, and online assessment methods and examine whether the participants' attitudes change toward the types of assessment after the tasks via Web 2.0 tools are implemented. In the light of these aims, the study was conducted with 40 second grade ELT pre-service teachers at a state university in the fall semester of 2013-2014 academic year. The study was conducted in a fourteen week period in which 6 different tasks with 7 different Web 2.0 tools were implemented. The data for this study were collected through pre-survey before the implementation, reflection papers during the implementation, and post-survey and semi structured in-depth interviews after the implementation of the tasks. The findings of the study indicated that the perceptions of the participants toward the alternative assessment via web 2.0 tools were positive before the tasks were implemented and it got more positive after the task implementation process. In general, the participants preferred alternative assessment to online or traditional assessment since they believed alternative assessment is motivating, enhances learning, provides continuous assessment of student progress, increases interaction, gives more detailed and practical feedback, and improves critical thinking skills. The results of both qualitative and quantitative data supported each other.

Keywords: ELT pre-service teachers, alternative assessment, Web 2.0 tools

Introduction

The rapid expansion of technology in people's everyday life led the educators to integrate technology into education for instructional and assessment purposes. For an English as a Foreign Language (EFL) teaching method to be successful, it needs to be learner centered, motivate and encourage the students, address the variety of students and assess all the skills of the language in balance, in which the traditional assessment methods cannot succeed. As a result of the growing increase in the dissatisfaction of the traditional assessment methods, alternative assessment methods such as portfolios, self- and peer-assessment, projects are seen as effective in accomplishing the goals of language teaching that the traditional assessment cannot. In the last few decades, language teacher education programs have started to search for a language teaching theory which is more practical based on observations, practice teaching, and curriculum and materials development to fit themselves into the appropriate place in the digital age (Crandall, 2000). However, the lack of the teacher training especially

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in technology integration presents the portrayal of inexperienced and unqualified teachers who do not know how to make use of technology to improve the language development of their students.

Even though the teacher education programs are facing the challenges of benefiting from web 2.0 tools, which are web applications on the internet, to enhance language learning, the number of the web 2.0 tools and the scope of its use in the world is expanding rapidly, which makes it harder for the teachers to resist its wider use in their own classes. Albion (2008) indicated that it is significant for the teacher educators to realize the educational potential of the web 2.0 and they need to benefit from it to enhance language learning and prepare their graduates so that they can apply web 2.0 in their future careers. Seeing that in the literature the studies are rare on alternative assessment related to the performance of the students but just includes the studies reflecting the perceptions of teachers or students and even less common in Turkey, the present study was seen as a necessity to enlighten what the pre-service teachers think about the integration of web 2.0 tools to their classes for the purpose of alternative assessment after they practiced the tasks via web 2.0 tools in a course that they were offered. Therefore, this study investigates the perceptions of the ELT pre-service teachers toward traditional, alternative and online assessment. In addition, this study examines how much the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools.

For this reason, in this study, answers to the following questions are explored:

1. What are the perceptions of the ELT pre-service teachers toward the types of assessment: traditional, alternative and online?
2. To what extent do the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools?

Review Of Literature

With the rapid expansion of instructional technology in education, the roles of the 21st century teachers and students have differed from those of the past in having the technological literacy. For this reason, the teachers are supposed to adapt a curriculum which provides real-world technology-rich experiences and authentic assessment (Warner, Steffen, & Cope 2011). To do this, the central role of the teacher needs to be equipped with related knowledge and

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skills to pursue its place in today's technologically advanced language classrooms. Therefore, the more knowledgeable teachers are in the educational technology, the better they can address the challenges of the gradual increase in student knowledge and skills. In the employment process, among the conditions of the job postings, the experience with educational technology has already taken its place. However, Kessler (2006) stated that the graduates of the formal language teacher education programs do not seem like having gained the necessary knowledge and skills related to instructional technology since these programs disregarded to include the instructional technology courses to their curriculums. Crandall (2000) also mentioned that language teacher education programs have not been successful in guiding the teachers to adapt the requirements of the modern classroom environment. Since most of today's pre-service teachers are the regular users of the network-based technology and accustomed to be in a mass media-dependent environment, the goal of the teacher education programs should be to teach pre-service teachers how to use technology in their classes for teaching and assessment purposes.

So far almost every educated person was assessed by the traditional methods in his/her life a few times. As mentioned by many researchers repetitively, Balliro (1993) also indicated the dissatisfaction with the traditional assessment methods by stating that the traditional assessment methods remain incapable of sufficiently representing the learner strengths and true progress. Since the traditional assessment methods do not fit well with the current English language learning practices, searching for the alternative ways of assessing the students were imperative. With the need to support student learning by including students' voices and giving them the opportunity to share the decision making process in their own learning and assessment, the pursuit of alternative assessment methods arose. Barootchi and Keshavarz (2002) suggested that alternative assessment known also as nontraditional assessment is used like an umbrella term for the types of assessment except for anything other than standardized, traditional tests. Highlighting that the alternative assessment methods came out as a contrast to the traditional assessment methods, what Bailey (1998) mentioned is that the traditional assessment methods are one-shot, indirect and inauthentic while alternative assessment methods are continuous, longitudinal, direct and authentic assessments. Unlike the traditional assessment methods which dictated the students the existence of one right answer, the alternative methods encourage the students to explore the possibilities by drawing on their own inferences. The instructors could gather information on their students' abilities, talents, interests, potentials since alternative methods are capable of reflecting students' performance in educational settings (Barootchi & Keshavarz, 2002). Among the alternative assessment

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procedures, checklists of student behaviors or products, journals, reading logs, videos of role plays, audiotapes of discussions, self-evaluation questionnaires, work samples, and teacher observations or anecdotal records take place. The constant changes from the traditional assessment toward alternative assessment were summarized by Herman et al. (1992) as follows:

- From behavioral to cognitive views of learning and assessment
- From paper-pencil to authentic assessment
- Portfolios: from single occasion assessment to samples over time
- From single attribute to multi-dimensional assessments
- From near exclusive emphasis on individual assessment to group assessment (p.13)

To fulfill the requirements of these procedures and gain principal skills like critical thinking, problem solving, communication and collaboration indispensable for all types of learners, especially for language learners could be developed with the Web 2.0 practices since students are given the opportunity for active participation and multi-way communication through the authentic and meaningful materials provided by the Web 2.0 technologies. Since learning a second language requires the development of the all four skills, namely listening, reading, speaking and writing, designing assessments with the integration of technology can fulfill what the traditional assessments cannot by motivating the learners and supporting their learning with the sources reached by means of the Web 2.0 tools.

The new generation of web-based technologies, Web 2.0 was first coined as an invented term in 2005 and described by Tim O'Reilly (2007) as "a set of principles and practices that tie together a veritable solar system of sites that demonstrate some or all of those principles, at a varying distance from that core" (p.18-19). With the Web 2.0 tools, learning can be enhanced since each piece of information on the Web is connected to one another via hyperlinks, which helps students to learn something new as they keep digging (Solomon and Schrum, 2007). The instructors can even invite experts from far end of the world to their classes as a guest speaker and these experts could present a topic, attend a class discussion or just answer the questions through web conferencing and online chat options. The need of reaching the professional sources to enhance learning and as its natural outcome to adapt online assessment trends, especially the language teachers should be guided on how to implement online assessment methods with authentic, communicative, multicultural and

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pedagogically appropriate materials. Therefore, as the integration of the Web 2.0 practices into education for instructional and assessment purposes has a recent history, the specific guidelines and detailed and clear pedagogical strategies are needed. Ching and Hsu (2011) also argued that the Web 2.0 practices should be purposefully designed for instruction and assessment; otherwise, the practices with Web 2.0 technologies would not fulfill their job. Since today's instructors are 'digital immigrants' and the students 'digital natives' when mentioned with Prensky (2001)'s words, the instructors had better learn how to adapt their classes what technology offers, to grab the attention of the students and make up for the generation gap. Realizing the urgent need of keeping up with the skills of the 21st century students, Gray et al. (2012) accepted the fact that there is still a lot to do before feeling confident in adapting a reliable, fair engaging and substantial assessment with the use of Web 2.0. If the research conducted so far related to the integration of Web 2.0 tools for the assessment purposes in ELT is exemplified, Cephe and Balçıkanlı (2012), in their study exploring the beliefs of the student teachers from an ELT program in Turkey, found out that web 2.0 technologies facilitate interaction and collaboration, provide chances for learning other than class hours considering that especially the language learners spend their time mostly on online language learning tasks, boost motivation, participation and student involvement in the learning process, raise the digital literacy awareness and help student teachers with their future career by expanding their professional repertoire. This study was found necessary since in the literature, even though the perceptions of the pre-service teachers on the technology integration were investigated; their perceptions when they practiced these technologies were not reflected. In another study based on the in-service teachers' practice of the web technologies, Oliver (2007) stated that the participants mentioned the practice with web technologies were useful in a way that they make students spend their time learning on the Internet, discover numerous resources while searching the topic of the assignment, connect ideas, and organize sources and strategies. Moreover, Gray et al. (2012) explored the Australian academics' assessment of students' web 2.0 activities. The results suggested that other than a few challenges and risks, the academics generally found the assessment with web 2.0 tools necessary and valuable. In another study conducted by Göktürk-Sağlam and Sert (2012), perceptions of the ELT instructors toward the use of technology in language teaching were investigated. According to the results, the participants were in favor of technology in language learning environment. The participants were inclined to consider the gap between 'the digital natives' the students and the 'digital immigrants' the teachers themselves;

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therefore, they approved the integration of technology as it is hard to ignore the fact that students spend most of their time outside the class on the Internet. The disadvantages of technology integration indicated by the participants were mostly related to the technical difficulties and inaccessibility of technology. Kumar and Vigil (2010); on the other hand, examined pre-service teachers' perspectives on the use of web 2.0 technologies in teacher education courses. This study is crucial in providing insight on how to prepare the pre-service teachers for the digital age where the students are all digital natives since it helps understanding the perspectives, needs and practices of pre-service teachers better. The results suggested that the participants believed these technologies can be valuable in their own courses and their professional career. In addition, Ishtaiwa and Dukmak (2013)'s study revealed that ELT pre-service teachers expressed that web 2.0 tools enhanced learning after they experienced the use of blog and wiki in the course they took. They believed web 2.0 tools help them to learn in collaboration, interact with each other, share what they know and have done together with developing reflective and critical thinking skills.

The studies cited above on the integration of Web 2.0 technologies into the classrooms mostly focus on revealing the perspectives of either the students or the pre-service teachers. Even though finding out the perspectives of the pre-service teachers and students are significant, it is important to discover the opinions after practicing the web 2.0 technologies in the classroom with participants and observing their reactions and finding out their ideas afterwards since the literature misses the relevant research conducted with real classroom practice. Hence, the present study investigates the perceptions of the participants by comparing their opinions before and after the implementation of tasks through web 2.0 tools.

Methodology

Setting and Participants

The study was conducted at the English Language Teaching (ELT) department of Istanbul University because of its convenience for the researcher. The data for this study was obtained from the undergraduate students who take the must course "ELT Methods I" offered during the first semester of the second year. From the 115 students who were taking the course "ELT Methods I" in the fall semester of 2013-2014 academic year, the data collected from 40 students were used for this study since these 40 students have fulfilled almost all the requirements of the study. While the 35 of the students have done all the requirements, 5 of them completed all five tasks except one task. The participants were numbered from 1 to 40

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(e.g. P1 for Participant 1). The reason for including only the students who have attempted almost all the requirements is that the post-survey used for this study were asking for comparison among the tasks after they had been implemented in the course "ELT Methods I" and if the students did not do all of the tasks, they wouldn't be in a position to compare the tasks with one another. Therefore, the researcher needed to exclude the 75 students from the study who did not attempt more than four of the tasks.

Data Collection Instruments

For the present study, four data collection instruments were used: a pre-survey, reflection papers, a post-survey, and a semi-structured in-depth interview. The pre-survey designed for revealing the attitudes of the participants toward assessment and technology was conducted at the beginning of the term before the researcher started to assign the tasks. The reflection papers were collected from the participants right after each task. The post survey was implemented after the participants had submitted all the tasks. The in-depth interviews were conducted one week after the post-survey was conducted which was the end of the term.

Data Collection Procedures

The study was conducted in the course "ELT Methods I" which is offered during the first term of the second year of the ELT Department. After the pre-survey was given at the beginning of the term to the participants, 6 different tasks via 7 different web 2.0 tools designed for the study were implemented in the 14 week period of the term. Before the tasks were implemented, the pre-service teachers taking the course "ELT Methods I" were clearly informed that the data gathered from the tasks would be used for the study that the researcher conducted. Additively, the researcher stated that although not completing the tasks and reflection papers would impact their overall grade, the participants neither have to fill in the pre- and post-survey nor participate in the interviews. By this way, the students were given chance to fulfill their responsibilities just for the course but not participate in the study. The number of the tasks was arranged considering the weeks that the course instructor is planning to integrate a task.

After the data was collected through pre-survey, the researcher started to assign the tasks. Among the materials designed for each task, a guideline, rubric, sample task, reflection paper

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has been introduced in class and uploaded to “Edmodo” after the class hour (see sample student copy of a task with a Web 2.0 tool “Glogster” in Appendix A and see a sample rubric in Appendix B). All the materials used for the tasks and the tasks themselves were designed by the researcher. Edmodo which is an educational platform, was used for uploading and downloading task materials and contacting the course instructor or the other pre-service teachers. The tasks and the web 2.0 tools used in each task were displayed in the table below:

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Task	Web 2.0 tool
Task 1 – Answering the reflective question by recording your voice for the avatar you designed	Voki
Task 2 – Preparing a quiz	Testmoz
Task 3 – Preparing a mindmap	Mindomo
Task 4 – Designing a classroom activity	Facebook
Task 5 – Designing a poster	Glogster
Task 6 – Preparing a presentation and video	Prezi & Screencast-O-Matic

Table 1: The tasks and the web 2.0 tools used in each task

The pre-service teachers were clearly stated what was expected of them in each task, how they would be assessed, what attainments they would have at the end of each task. Right after each task, the participants were supposed to submit a reflection paper which is one of the data collection instruments designed for the present study. When the task implementation process was over, the participants were given the post-surveys. As the last data collection instrument, the semi-structured in-depth interviews were conducted with the participants who volunteered. In brief, the data for this study were collected through pre-survey before the implementation, reflection papers during the implementation, and post-survey and semi structured in-depth interviews after the implementation of the tasks.

Data Analysis Methods

In this study both qualitative and quantitative data were gathered and analyzed; therefore, the results of a mixed method research is presented. The qualitative data was collected via open-ended questions in the pre- and post-surveys, reflection papers and semi structured in-depth interviews. To analyze the qualitative data, a qualitative data analysis method, constant comparative method was used. The responses of the participants to the open-ended questions in the pre-surveys, post-surveys and reflection papers were translated into English and categorized. The data collected via the interviews were first transcribed, translated into English and categorized. The quantitative data collected from the pre-surveys, post-surveys and reflection papers were statistically analyzed using the program Statistical Package for the Social Sciences (SPSS), version 20.0. The analysis of the data gathered from the reflection papers were made by running an ANOVA test.

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Results And Discussion

The findings of the study revealed that almost all the participants (between 82,5% and 92,5%) had never used the web 2.0 tools, which were planned to be used for the tasks of the study, to get grades in a course. Most of the participants (87,50%) did not take any courses in instructional technology before and only 10% of the participants took part in online assessment before. This shows that most of the participants were neither experienced in instructional technology nor being assessed online.

According to the results obtained from the pre-survey, even though almost all the participants are not experienced in instructional technology or familiar with online assessment, the general attitude of the participants toward the integration of technology into education is positive with the mean of 3,103. The majority of the participants stated that the use of technology in their courses motivates them (n=32); therefore, technology should be integrated to their lessons more (n=38). Except for only one participant, all the participants (n=39) believe that they learn better if they can practice what they have learned in class with the help of multimedia. Additively, most of the participants (n=32) believe that sharing materials online is fun, they (n=36) prefer seeing more examples of the use of technology in their English classes, and the use of technology improves their success (n=36). Most importantly, since the participants are ELT students, they (n=37) stated that they would like to use technology to teach English when they become full-time English teachers.

In the pre-survey, when the participants were asked whether they had written a reflection paper before which was planned to be used to collect data for the present study as part of the alternative assessment of the participants, almost half of the participants indicated that they had written reflection papers before. In the post-survey, a sub-section was spared to reveal the participants' perceptions toward the reflection papers after they wrote reflection papers for each task during the data collection process. The findings indicated that most of the participants (n=32) believed in the effectiveness of the reflection papers by stating that reflection paper is a nice way of having their voice heard by the instructors when they need, helped them to improve their critical thinking skills, and made them realize what they had done so far. However, the number of the participants (n=17) who did not believe in the usefulness of the reflection papers is high enough to take into consideration. Therefore, the number of the participants who supported the use of reflection papers in their courses outnumber that of the participants who did not want the reflection papers to be used in their other courses; it is possible to deduce that most of the participants reflected a positive attitude

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toward the use of reflection papers for educational purposes as the mean of general attitude, 2,972 indicates. Since the reflection papers are part of the alternative assessment, it is understood that the participants support the use of alternative ways of assessment by their instructors.

In pre-survey, the participants were asked to state their perceptions toward technology in education before they were assigned to the tasks. In almost all the questions, the participants showed a highly positive attitude toward the use of technology in education with the mean of general attitude, 3,103. The majority of the participants stated that the use of technology in their courses motivates them (n=32); therefore, technology should be integrated to their lessons more (n=38). Except for only one participant, all the participants (n=39) believe that they learn better if they can practice what they have learned in class with the help of multimedia. Additively, most of the participants (n=32) believe that sharing materials online is fun, they (n=36) prefer seeing more examples of the use of technology in their English classes, and the use of technology improves their success (n=36). Most importantly, since the participants are ELT students, they (n=37) stated that they would like to use technology to teach English when they become full-time English teachers. The results indicate that the idea of involving technology in education was favored by the participants before the tasks with Web 2.0 tools were implemented. The same part asking for the perceptions of the participants toward technology in education was included in the post-survey as well to compare whether any attitude differences occur after the tasks with web 2.0 tools were implemented. The analysis of the participants' responses showed that the mean of the general attitude is 3,150 which is a bit higher than that of the pre-survey. Specifically, the analysis of one of the items show that the mean value of the post-survey (m=2,950) was higher than the pre-survey (m=2,675), which means the participants now use the Web 2.0 tools (wikis, blogs, social networking sites etc.) more actively in their daily activities after the task implementation process. Overall, it is seen that even if in both of the surveys the participants had a positive attitude toward technology, in the post-survey the participants had a more positive attitude toward the use of technology after the task implementation.

In both pre- and post-survey, a section was designed to reveal the participants' attitudes toward the assessment types. Below, the results of the analysis were summarized under separate headlines according to each assessment type:

Traditional assessment:

The analysis shows that in pre-survey the mean value was 2,223 while in post-survey the mean was 2,123, which clarifies that the participants had a negative attitude toward the use of

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traditional assessment in both pre- and post-surveys. In post survey, since the mean value is lower than that of pre-survey, it can be said that in post-survey, the participants' attitude got more negative after the tasks were implemented. Therefore, according to the items in the surveys, it can be said that the participants feel under pressure when they have to take the midterms and the finals in class, they believe traditional assessment methods cannot assess practical skills or application of knowledge, the traditional assessment methods are not enough to assess team or collaborative learning, and the traditional assessment methods do not pay attention to the individual needs and interests of the students.

Alternative assessment:

The participants' responses indicate that the general mean was 3,083 in the pre-survey while it was 3,212 in the post-survey. This makes it clear that the participants took a positive attitude toward the use of alternative assessment in both pre- and post-surveys. Considering the items in the surveys, the participants believe alternative assessment methods helped them to become a more autonomous learner after the tasks were implemented, they think self-assessment through reflecting on their work and peer-assessment is useful in their courses, they prefer to be assessed by a series of tasks throughout the semester instead of being assessed by just a midterm and a final, they believe they are more motivated by the alternative assessment methods, they support the idea that alternative assessment methods provide authentic and continuous assessment of students' progress, they think in alternative assessment methods students get more detailed and practical feedback compared to traditional assessment methods, they agree that alternative assessment methods provide students the opportunity to interact with their teachers and classmates during the teaching/learning process and they indicate that alternative assessment methods improve their critical thinking skills more than traditional assessment methods. Since the mean value of the post-survey came out higher than the pre-survey, it can be said the participants support the idea more than they supported in the pre-survey that alternative assessment methods helped them to improve themselves more than traditional assessment methods did. However, there is still a point which needs to be highlighted that among the items in the surveys, the item which has the highest mean reveals that the participants believed both traditional and alternative assessment methods should be used in combination in a course (mean in pre-survey: 3,425 and in post survey: 3,375), which shows us that even though the participants are criticizing the traditional assessment methods in some negative aspects, the participants think that using both traditional and assessment methods together would better assess a students' performance since both methods have their own strengths and weaknesses.

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Online assessment:

The analysis reveals that the general mean of pre-survey is 2,762 while the general mean of the post-survey is 2,983, which shows that the participants had a positive attitude toward the use of online assessment in both pre- and post-surveys. Nevertheless, since the general mean of post-survey is higher than the pre-survey, it can be said that after the task implementation, the participants showed a more positive attitude toward the use online assessment methods. Still, one of the items to which the participants' attitude differs in pre-and post-survey reveal that while the participants did not take a positive attitude toward being assessed by the use of technology instead of paper-based tests in the pre-survey, they supported being assessed via technology in the post-survey. Comparing the mean values, it is also possible to say that in post-survey the mean value is higher than that of pre-survey, which means in post-survey, the participants prefer to receive private online feedback instead of getting it in front of their classmates much more than they did in the pre-survey. Also, the participants supported the statement in the post-survey that online assessment methods can assess specific skills in English through computer-based testing better than other assessment methods even though they did not believe in this idea in the pre-survey. In addition, the participants agreed much more than they did in the pre-survey that it is better to be assessed online because the teachers can appeal to different types of learners. The participants also supported the statement in both pre- and post-surveys that online assessment is helpful because teachers and learners do not have to be in the same physical place. Especially in the post-survey, the participants showed a highly positive attitude toward the statements that online assessment is more suitable to assess English language and teaching skills and online assessment can provide authentic tools that other assessment methods cannot provide in English methodology courses. Most importantly, the participants agreed to the item that they would like to use online assessment methods in their English courses when they graduate and become a teacher.

In both pre- and post-surveys, an open ended question 'Which one of the following assessments do you prefer as a student in your methodology courses? Why?' was asked. To give an answer to this open-ended question, the participants needed to choose the assessment method they prefer among the given three types of assessment methods presented in figure 1 below. Then, they explained their reasons for their choice. The comparison of the participants' answers to this open ended question before and after the task implementation process was made.

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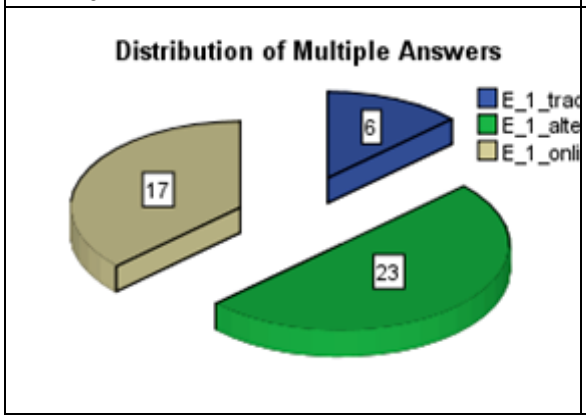
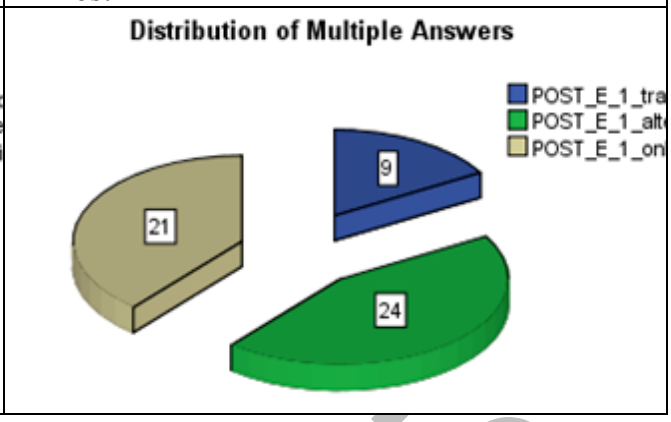
Pre	Post
	

Figure 1: Comparison of participants' assessment type choice in pre- and post-survey

The analysis shows that since there are 40 participants in the present study, it is understood that some of the participants made more than one choice in both of the surveys. As a result, it can be said that the responses of the participants did not present much difference after the task implementation process. Still, most of the people preferred to be assessed by the alternative assessment methods in both pre- and post-surveys while the number of people supporting the traditional assessment methods is the lowest in the post-survey just like it was in the pre-survey. Therefore, the reason why the comparison in this section was made is to see how many people there are who support the use of more than one assessment type among all the responses and what choices they made.

In the end, semi-structured in-depth interviews were conducted with the four participants who fulfilled all the requirements of the data collection process including the pre-survey, tasks, reflection papers and post-survey. The interview was composed of 5 main categories and in one of them the participants were asked questions which requires the participants to compare traditional and online assessment methods. The responses of the participants show that they believe they cannot reflect their performance very well in the traditional exams since they feel stressed. Therefore, they get low grades from the exams even if they know the answers of the questions. However, while doing the online tasks, they feel comfortable so they can express themselves better or they can go back and fix their mistakes before they submit their tasks to the instructor. That's why, the participants believed online assessment is fairer. The participants also added that integrating technology increased the quality of the lessons, online assessment provided opportunities to both the students and the teachers,

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Edmodo and the reflection papers improved the communication between the teachers and students. The representative responses of the participants are given below:

> Thanks to the tasks, we could express our knowledge without being under the pressure of the time. In addition, knowing these tasks is like an investment for the future since we are going to be teachers. As students, we had chance to be assessed fairly, we could make up for a mistake. The tasks also provided us a more flexible and comfortable environment (P4, 07/01/2014).

> Since we had the chance to see our classmates' tasks by just clicking on their tasks' links, we can compare theirs with our own tasks and we can improve our task. By this way, we can learn from each other and improve ourselves (P3, 30/12/2013).

> Using a social platform for our own class is definitely necessary since it gives us chance to follow the course even if we were absent during the class hours. We can see the materials and learn our assignments. It is an advantage to be able to submit the assignment even if you did not attend the lesson. Also, it is sometimes difficult to find the teacher in his/her office. Instead, we can communicate with our teacher via Edmodo much faster. Besides, when a student asks a question, everybody can see the teacher' answer (P4, 07/01/2014).

> Reflection papers were helpful for both the teachers and the students. They helped us to express our ideas about the tasks and realize the tasks' positive and negative sides which will be helpful for us in the future. In addition, you had ideas on how to fix the tasks and improve them since you learned how we felt about the tasks (P2, 31/12/2013).

The results of the pre-survey reveal that almost all the participants did not benefit from the web 2.0 tools that were used in the present study to get grades in a course before. Let alone these web 2.0 tools, one out of ten students took part in the online assessment before the present study which is clearly very low. Considering this background of the students in relation to assessment via technology, naturally they were not aware of the merits and demerits of the online assessment. However, they were obviously aware of the disadvantages of the traditional assessment since they had been tested by the traditional methods for years. Related to the traditional methods, in the pre-survey, the participants complained about

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feeling under pressure during the midterm and final weeks. In addition, they indicated that the traditional assessment methods do not allow students to present their real performance and give importance to the needs and interests of the students. However, there were still almost half of the participants who preferred traditional assessment methods to projects or take-home exams in the pre-survey. The results of the post-survey were in the same direction with the pre-survey except that the attitudes of the participants revealed a more negative attitude in the post-survey toward the traditional methods (General attitude: pre-survey, 2,223; post-survey, 2,123). As pre-service teachers, majority of the participants indicated in the post-survey that they would not assess their students in traditional ways when they become a full-time EFL teacher even though there were still 15 participants who would. This shows that even though the participants disapprove the traditional assessment more than before, there are still some participants who did not change their ideas and kept supporting the traditional assessment methods even after they did the tasks.

In relation to the alternative assessment methods, in the pre-survey, the participants supported each and every statement that encourages the use of alternative assessment. Almost all the participants believed that self and peer assessment contributed to their learning and alternative assessment methods made them feel more competent and autonomous. However, in the pre-survey, almost all the participants made it clear that the traditional methods should not be completely abolished but combined with the alternative methods. In the post-survey, the participants' attitudes got more positive but still even much more participants were willing to see the implementation of alternative assessment together with traditional assessment. This clearly proves that the participants benefited from the tasks but they still believe in the necessity of the traditional assessment methods; therefore, it can be said that they may be using the alternative and traditional assessment in combination in their own classrooms when they become full-time EFL teachers.

In addition to the positive perceptions of the participants toward the alternative assessment methods, in the pre-survey, the majority of the students showed a positive attitude toward the use of online assessment methods as well by saying that the immediate feedback is provided, practicality and sharing are enhanced by the online methods even though almost half of the participants were not in agreement with the participants who had sympathy for the idea that the English language learning and teaching skills could be assessed through online methods. In the post survey, on the other hand, the participants' general attitudes were more positive but for some items the number of the participants who agreed and disagreed was almost the same. In these items, almost half of the participants believed that traditional assessment

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should not be replaced with technology based assessment, the exams should not be integrated with the technology, and online assessment is not more suitable to assess English language and teaching skills. Even though the participants who believed vice versa are more than half of the participants, there is still significant number of people who showed negative attitude toward online assessment methods. But still, the general attitude of the participants toward the use of online assessment came out positive in the post-survey just like it was in the pre-survey (General attitude: pre-survey, 2,762; post-survey, 2,983). As the attitude of the participants was more positive toward the online assessment after the tasks were implemented, it can be said that the participants had pleasant impression about the tasks.

When all three assessment types were compared, the order from the most preferred assessment type to least preferred assessment type was the same in both the pre- and post-surveys. While the most preferred assessment type was alternative assessment, the least preferred one was the traditional assessment. Even if the order of the participants' preference did not change, the general means of each assessment type changed. After the tasks were implemented, while the attitudes toward the alternative and online assessment methods got more positive, the attitudes toward traditional assessment methods got more negative, which makes it clear that the tasks had a positive effect on the participants.

Since assessment and technology is now an indispensable part of teaching and learning, as traditional assessment kept losing its popularity, alternative assessment via technology gained importance than ever. For the alternative assessment to be as successful as aimed, the factors to be implemented should be well-planned during design and administration phases. To obtain fertile outcomes from the alternative assessment, the language skills to be addressed, the technological level of the target learner profile, the schedule of the tasks should be specified carefully. In the present study, the participants were not content when the two of the tasks clashed with their midterm and final exams, which affected their performance in a negative way as seen in their reflection papers and interviews. In addition, since the tools were all new to them and they were not given any training before the task implementation process except for the guidelines given before each task, they complained about spending too much time figuring out the tool than the task itself. For all these reasons, the instructors should take very purposeful steps while planning the alternative assessment process.

As for the limitations of the study, the data could have been gathered from the other grades of the same department and other ELT departments of the universities in Turkey. Therefore, it would have been much easier to generalize the results for the teachers who are interested in integrating web 2.0 tools to their classes for the purpose of assessment. A further research

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could be done with many more participants at different grades and universities to find out the perceptions of the students toward the technology integration to their courses. Additively, the period in which the study took place was for one semester – fourteen weeks; therefore, to monitor the long-term effects of the participants' perceptions toward being assessed via the web 2.0 tools, this period may not be adequate since the participants of the current study did not have the experience in web 2.0 tools and they were just getting used to them in this one semester. Hence, to reach more comprehensive results, longitudinal studies which last for one year or more can be carried out on the web 2.0 integration to courses for the purpose of alternative assessment.

Implications And Limitations

This study is crucial in providing insight on how to prepare the pre-service teachers for the digital age where the students are all digital natives since it helps understanding the perspectives, needs and practices of pre-service teachers better. As also supported by the results of the study that almost all the pre-service teachers who participated in this study displayed positive perceptions toward adapting web 2.0 tools for assessment purposes, the instructors and administrators should start concentrating on how to integrate web-based technologies to their assessment system. The technology integration should start at schools as from the primary schools and even so before the task implementation, the process and how to use web 2.0 tools should be introduced to the students. In addition, motivating the students and having their attention has always been an issue for the teachers. During the present study, at every chance they got, the participants mentioned that web 2.0 tools made the course content more interesting, colorful, and enjoyable. Since the teachers have to make extra effort to keep the students motivated and focused especially while teaching English, they need to integrate web 2.0 tools to their curriculum. The challenges which prevent language teachers from technology integration for assessment purposes originate from lack of guidelines for planning, technological training, practice and technological equipment of schools and students. Language teachers who plan to adapt alternative assessment with the use of web-based technologies should be provided sources with guidelines and trained beforehand either during ELT pre-service teacher education or in-service training. The language teachers, who possess the necessary knowledge on technology and the guidelines from the related sources, should be given the opportunity to practice their knowledge, observed by the teacher educators and given feedback related to their improvement. The last but not the least, the language teachers should be provided with the necessary technological equipment by the

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administration of their schools and take into consideration whether their learners have their own personal computer or device to connect to the internet. If not, the possible solutions should be discussed at the planning phase and the tasks should be designed accordingly.

As for the limitations of the study, the data could have been gathered from the other grades of the same department and other ELT departments of the universities in Turkey. Therefore, it would have been much easier to generalize the results for the teachers who are interested in integrating web 2.0 tools to their classes for the purpose of assessment. A further research could be done with many more participants at different grades and universities to find out the perceptions of the students toward the technology integration to their courses. Additively, the period in which the study took place was for one semester – fourteen weeks; therefore, to monitor the long-term effects of the participants' perceptions toward being assessed via the web 2.0 tools, this period may not be adequate since the participants of the current study did not have the experience in web 2.0 tools and they were just getting used to them in this one semester. Hence, to reach more comprehensive results, longitudinal studies which last for one year or more can be carried out on the web 2.0 integration to courses for the purpose of alternative assessment.

Conclusion

The present study investigates the perceptions of ELT pre-service teachers on the use of web 2.0 tools for the purpose of alternative assessment. The study aims to find out the perceptions of the ELT pre-service teachers toward the types of assessment and whether the ELT pre-service teachers' attitudes change toward traditional, alternative and online assessments after being assessed via Web 2.0 tools. The data was gathered through pre- and post-surveys, reflection papers, and a semi-structured in-depth interview from 40 second grade students who took the must course "ELT Methods I" at the ELT department of a state university. The results indicated that the participants showed a positive attitude toward the alternative assessment via web 2.0 tools more than they did to traditional or online assessment even though most of the participants believed in the necessity of the use of both the alternative and traditional assessment methods in combination.

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Appendix A: A sample student copy of a task with a Web 2.0 tool "Glogster"



Appendix B: A sample rubric copy

TASK 5 Rubric					
Assignment: Designing a poster on the Total Physical Response Method. **Name and Surname of the Learner:** _____					
	0 point	**1 point**	**2 points**	**3 points**	**4 points**
Content and Method	Method is not clearly mentioned. Content and method do not match at all.	Insufficient touch upon the method. Content and method minimally match in the activity with almost no creativity.	Somewhat covers the method. Content and method moderately match in the activity with one or two creative ideas.	Covers the method with few missing points. Content and method adequately match in the activity supported by some creative ideas.	Covers the method very comprehensively and clearly. Content and method perfectly match in the activity and reflected with creative ideas.
Meeting the Submission Requirements of the Task (Deadlines, use of Technology, Reflection Report)	Did not complete almost all of the requirements of the task and could not handle the technical features of the tool.	Completed the requirements of the task insufficiently and had a lot of technical problems managing the tool.	Completed some of the requirements of the task and had a few technical problems managing the tool.	Completed most of the requirements of the task and had few or no technical problems managing the tool.	Completed the requirements (4 steps) of the task perfectly and didn't have any technical problems managing the tool.
Layout of the poster	No or very little effort on the poster design. Readers would not prefer to learn from this poster.	Insufficient effort on the poster design. It looks boring and complicated.	Made use of some utilities the tool provides for the design. The poster looks okay.	Although the poster doesn't possess all the utilities the tool provides, it still has an attractive design.	Has a very attractive, colorful and creative design with graphics, colors etc. Readers would definitely enjoy it.
Variety of the sources	Did not support the content with any related sources to the content.	Supported the content with one or two sources (links, videos, images, audios and notes) not matching the content so much.	Supported the content with some sources (links, videos, images, audios and notes) sort of fits the content.	Reinforced the content with a few sources (links, videos, images, audios and notes) adequately matching the content.	Reinforced the content with various sources (links, videos, images, audios and notes) totally matching the content.
Pair evaluation	Did not fill in the evaluation form except for few insincere comments.	Did not pay attention to the evaluation form so much. The parts filled in are not so sincere.	Filled in the evaluation form with not so much sincerity and added few or almost no useful ideas.	Filled in almost all the evaluation form fairly and added some useful ideas.	Filled in the evaluation form completely and added very useful ideas with all sincerity.
					TOTAL: _____/20

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Bilişim Suçları ve Kırşehir İlinde Bilişim Suçları Kapsamında Yaşanan Olayların İncelenmesi - Alınabilecek Tedbirler

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Özet

Günümüz teknoloji çağında bilişim sistemleri her geçen gün yaşamın içinde daha fazla yer almakta ve hayatımızı kolaylaştırmaktadır. Bilişim sistemleri ile hızlı ve ucuz internet sesli - görüntülü haberleşme, elektronik imzanın kabulü ile ticari ilişkiler, internet bankacılığı hizmeti ile para transferleri, cep telefonları ve bunlar gibi pek çok yenilik hayatımıza girmiştir. Ancak bu teknolojik gelişmeler getirdiği birçok yararların yanı sıra aynı hızla gelişen bir takım problemlere ve suç tiplerine de zemin oluşturmuştur.

Bu çalışmada bilişim suçları nedir, bilişim suç çeşitleri nelerdir, ülkemizde meydana gelen bilişim suçları örnekleri ve 2011-2014 yılları arasında Kırşehir'de meydana gelen 11 adet bilişim suçu örnekleri, bilişim suçlarından dolayı mağdur olan kişi sayısı, faili belli ve faili meçhul olay sayıları, gerçekleşen olaylar sonucunda dolandırılan para miktarı belirlenmiş ve bu bilişim suçlarına karşı özellikle hukuki boyutlarından ziyade bilişim sektörü tarafından alınabilecek tedbirlere yer verilmiştir.

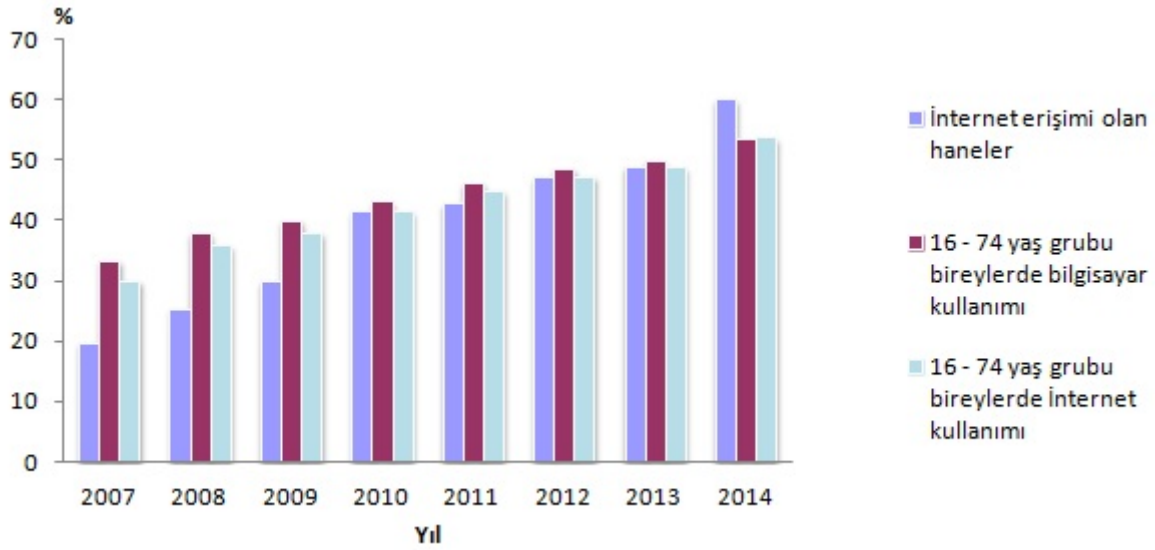
Anahtar Kelimeler: Bilişim suçu, internet suçları, bilim ve teknoloji

Giriş

Bilgi teknolojilerindeki başdöndürücü gelişim, yaşamımıza yeni suç türlerini de katmaktadır. Teknolojinin gelişmesi, küreselleşme, bilgisayar ve internete erişimin daha kolay ve daha ucuz olması toplumsal ilişkilerin değişmesine neden olmuştur. Teknolojideki bu köklü değişiklik hayatımızı kolaylaştırmasına rağmen bir takım güvenlik sorunlarını da beraberinde getirmiştir. Bilgisayar ve internet teknolojileri suç işlemeyi kolaylaştırmış ve bilişim suçlarının ortaya çıkmasına sebep olmuştur (Bilek, 2012). Bilişim teknolojileri (bilgisayar, internet, cep telefonu vs.) kullanılarak işlenen suçlar bilişim suçu olarak tanımlanabilir. Dijle & Doğan (2011)'ınında belirttiği gibi bilişim teknolojileri suç işlemek için bir araç olarak kullanılmaktadır. İnsanların hayatlarını kolaylaştırmak için geliştirilen bu teknolojiler aynı zamanda suç işlemeyi de kolaylaştırmıştır.

Tüm dünyada olduğu gibi ülkemizde de bilişim teknolojileri kullanımı büyük bir hızla artmaktadır. İnsanların bilgiye daha kolay ulaşmasını sağlayan bilişim teknolojilerinin 2007-2014 yılları arasında Ülkemizdeki kullanımına ilişkin Türkiye İstatistik Kurumu (TUİK) (2014)'nun yaptığı araştırma verileri Grafik.1' de gösterilmiştir.

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Grafik 1. 2007-2014 Yılları Arası Bilişim Teknolojileri Kullanımı *(TUİK, 2015)*

Grafik.1' e göre 2014 yılında internet ve bilgisayar kullanım oranları 2007 yılına göre yaklaşık 2 kat artış göstermiştir. 16-74 yaş aralığındaki bireylerde internet kullanım oranı %53,8 bilgisayar kullanım oranı ise %53,5'tir. Cinsiyete göre internet ve bilgisayar kullanım oranlarına bakıldığında ise Erkeklerde internet kullanım oranı %63,5 bilgisayar kullanım oranı ise %62,7 kadınlarda internet kullanımı %44,1 bilgisayar kullanım oranı ise %44,3 olarak hesaplanmıştır (TUİK, 2015).

Grafik 1'de tüm yaş gruplarında 16-24 yaş grubunun en yüksek İnternet ve Bilgisayar kullanım oranına sahip olduğu bunun yanısıra cinsiyete göre erkeklerin kadınlardan daha fazla İnternet ve Bilgisayar kullandıkları görülmektedir.

Düzenli internet kullanıcılarının oranı %44,9'dur. İnternet erişimi olan hane sayısı ise %60,2'dir. Bilgisayar ve internet kullanımındaki bu artışa paralel olarak internet üzerinden alışveriş oranları da artış göstermiştir. TUİK (2014) verilerine göre bireylerin internet üzerinden kişisel kullanım amacıyla ürün siparişi verme ya da satın alma oranı 2013 yılında 2014 yılına göre yaklaşık %25'lik bir artışla %24,1'den %30,8' e yükselmiştir. Bilgisayar ve internet kullanımındaki bu oranlar bilişim suçlarının etkili olabileceği çevrenin ne kadar geniş olduğunu göstermektedir. Alışveriş gibi sosyal etkinliklerin internet ve sanal ortamdan bilinçsizce yapılması bilişim suçu işlemeye meyilli insanların işini kolaylaştırmakta ve aynı zamanda bu tür insanların sayısını da artırmaktadır. Bu bağlamda bilişim suçlarına karşı alınacak hukuki tedbirlerin yanısıra bilişim teknolojilerinin kullanımı ve şifre, TC kimlik numarası gibi önemli bilgilerin gizliliği konusunda insanların bilinçlendirilmesi çok önemlidir. Bilek (2012)'in de yaptığı bir çalışmasında belirttiği gibi bu tür suçlardan mağdur olmamak için bilişim uzmanlarının tavsiyelerine harfiyen uyulması önem arz etmektedir.

Bilişim suçlarında araç olarak kullanılan bilişim teknolojilerinin bilişim suçu mağdurları tarafından üst düzeyde kullanılabilmesi ve bu teknolojilerle neler yapılabileceğinin farkına varılması bilişim suçu mağdurlarının sayısının azalmasına neden olabilir.

Bilişim Suçları

Bilişim Suçlarının Tanımı

Bilgisayar suçları, çeşitli otoriteler tarafından farklı şekillerde tanımlanmaktadır. En çok kabul gören tarif Avrupa Ekonomik Topluluğu Uzmanlar Komisyonunun yaptığı ”Bilgileri otomatik işleme tabi tutan veya verilerin nakline yarayan bir sistemde gayri kanuni, gayri ahlaki veya yetki dışı gerçekleştirilen her türlü davranış” şeklinde yapılan tanımdır (Alaca, 2008).

Bu topluluğun aldığı karara göre bilişim suçları beş kategoride toplanmıştır;

a. Bilgisayarda mevcut olan kaynağa veya herhangi bir değere gayri meşru şekilde ulaşarak transferini sağlamak için kasten bilgisayar verilerine girmek, bunları bozmak, silmek, yok etmek.

b. Bir sahtekârlık yapmak için kasten bilgisayar verilerine veya programlarına girmek, bozmak, silmek, yok etmek.

c. Bilgisayar sistemlerinin çalışmasını engellemek için kasten bilgisayar verilerine veya programlarına girmek, bozmak, silmek, yok etmek.

d. Ticari anlamda yararlanmak amacı ile bir bilgisayar programının yasal sahibinin haklarını zarara uğratmaki

e. Bilgisayar sistemi sorumlusunun izni olmaksızın konulmuş olan emniyet tedbirlerini aşmak suretiyle sisteme kasten girerek müdahalede bulunmaktır (RTUK, 2015).

Bilişim Suçlarının Çeşitleri

En çok karşılaşılan bilişim suçları aşağıda kısaca açıklanmıştır.

Bilgisayar Sistemlerine Ve Servislerine Yetkisiz Erişim

Kişinin bir bilgisayar ağına ya da bilgisayar sistemine yetkisi olmadan müdahale etmesidir. Saldırgan sistemin bir kısmına ya da bütününe, programlara veya içerdiği verilere ulaşma çabasındadır. İletişim metodu önemli değildir. Saldırgan bilgisayara doğrudan, telefon hattı vasıtası ile modem üzerinden yada başka bir bilgisayar sisteminden erişim sağlayabilir (RTUK, 2015).

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Bilgisayar Sabotajı

Bilgisayar Sabotajı, sisteme izinsiz erişimle birlikte erişim sağladığı sistemdeki bilgileri değiştirme yada silme şeklinde tanımlanmaktadır. Bir sisteme yada bilgisayara izinsiz erişim sağlayanlar; eriştiği bilgileri değiştirebilmekte, silebilmekte, kopyalayabilmekte yada yasa dışı kullanım için başkalarına satabilmektedirler. (Bilek, 2012)

Bilgisayar sabotajı iki sınıftır.

a) Çeşitli teknolojileri kullanarak sisteme giriş yapmak ve bilgileri silmek yada değiştirmek.

b) Sistemi fiziksel olarak işlemez hale getirmek veya zarar vermek suretiyle bozmak (Tulum, 2006).

Bilgisayar Yoluyla Dolandırıcılık

Bilgisayar ve iletişim sistemleri üzerinde hırsızlık ve dolandırıcılık yapmaktır. En çok kredi kartlarının kullanılması şeklinde karşımıza çıkmaktadır. Kredi kartı bilgilerinin çalınması için birçok kart kopyalama cihazı ve programı vardır. Bu cihaz ve programlar kullanılarak kredi kartı sahibinin haberi olmadan internet üzerinden alış veriş yapılabilmektedir.

Bilgisayar Yoluyla Sahtecilik

Üst düzey donanım özelliklerine sahip bilgisayar sistemleri kullanılarak sahtecilik suçunun işlenmesidir

"Bilgisayarlarla İlişkili Suçlar" Avrupa Konseyi Siber Suçlar Sözleşmesinde aşağıdaki şekilde yer almaktadır.

Bir Bilgisayar Yazılımının İzinsiz Kullanımı

Bir yazılımın, Fikir ve Sanat Eserleri Kanununda belirtilen lisans haklarının dışında kullanılmasıdır. Lisanslı bir yazılımın lisans sözleşmesinde ilgili programın ancak satın alan kişi tarafından kullanılabileceği, kopyalamak suretiyle çoğaltılamayacağı ve kiralanamayacağı belirtilmektedir. İnternetin yaygınlaşması ile lisanssız yazılım kullanım oranları oldukça artmıştır.

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Kişisel Verilerin Kötüye Kullanılması

Banka, hastane, alışveriş merkezleri ve devlet kurumları gibi kuruluşlarda tutulan kişisel yada değerli bilgilerin kendisine veya başkasına menfaat sağlamak veya zarar vermek amacıyla kişilerin rızası dışında kullanılmasıdır (Tulum, 2006).

Sahte Kişilik Oluşturma Ve Kişilik Taklidi

Sosyal paylaşım sitelerinde "sahte kişilik" oluşturma yaygın bir şekilde yapılmaktadır. Kötü niyetli kişiler başkaları adına sahte profil oluşturarak, o kişinin arkadaşları ile iletişime geçmek suretiyle dolandırıcılık yapmaktadırlar. Sahte profil oluşturma eylemlerinde yurt dışındaki uygulamalarda sahte profil oluşturan kişiler yüklü miktarda para cezasına çarptırılmaktadırlar (Bilisimhukuk.com, 2009).

Yasadışı Yayınlar

İnternet üzerinden yasadışı bilgilerin dağıtılması ve yayınlanmasıdır. Kanunun yasaklamış olduğu bu materyaller; Web siteleri (sayfaları), BBS'ler (Bulletin Board Services- Duyuru Tahtası Hizmetleri), elektronik postalar, haber grupları, forumlar, iletişim sağlayan her türlü araç, optik araçlar tarafından kayıt yapan tüm sistemler olarak kabul edilir (Dilek, 2007).

Ticari Sırların Çalınması

Bir sitemdeki ticari bilgilerin izinsiz girişler yapılması suretiyle kullanılması, dağıtılması yada elde edilmesidir. Bilgisayarların sabit diskleri biçimlendirildiğinde yada veriler silindiğinde sadece verilere erişim yolu silindiğinden şirketler ve kurumlar bilgisayarlarını tamire vermeden önce önemli bilgilerini güvenlik altına almalıdırlar. Aksi taktirde ticari bakımdan çok önemli olan bilgiler kötü niyetli insanların eline geçebilir.

Bilişim Güvenliğine Yönelik Saldırılar (Hacking, Cracking)

Bilişim sistemlerine yönelik saldırılara genel olarak "hacking" denmektedir. Ancak "hacking" terimi aslında "cracking" teriminin yerine kullanılır hale gelmiştir ve artık hem kamuoyu hem de medyada bu şekilde kullanılmaya devam edilmektedir. "Hacking" terimi; bilişim dünyasının yer altındaki (gizli kalmış) kişilerin kendi yeteneklerini geliştirmek

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amacıyla bilgisayar sistemlerinin en derin teknik detaylarıyla uğraşır hale gelmesi eylemine denmektedir (Schell ve Martin, 2006).

Terörist Faaliyetler

İnternet diğer alanlarda yaygın bir şekilde kullanıldığı gibi, terör örgütlerinin internet ortamında yapacakları eylem ve faaliyetler için de büyük imkânlar sağlamaktadır. Terör örgütlerinin yaptıkları sanal saldırılara aşağıdaki örnekler verilebilir;

- Uçakların uçuş yollarını belirlemeye, iniş ve kalkışlarını yönlendiren sisteme ulaşabilen bir terörist, sistemdeki bilgileri değiştirerek tüm uçuş planlarını alt üst edebilir ve kazalara neden olabilir.
- Gelişmiş pek çok ülkede şehir için trafik de bilgisayarlar aracılığıyla yönetilmektedir. Trafik bilgisayarına ulaşan bir terörist şehir için trafiği alt üst edebilir.
- Borsalar bilgisayar desteğinde çalışmaktadır. Eğer bir terörist, borsanın bilgisayar ağına erişebilirse neler yapabileceği açıktır.
- Bir sanal terörist barajın bilgisayar ağına erişebilmesi durumunda kayıtlarını ele geçirebilir, değiştirebilir ya da örgüt elemanını personel gibi kaydedebilir.
- Sanal teröristin kurumsal bilgisayar ağına ulaşması, kurum iletişimini engellenmesine, birimler arası iş ve işlemleri yapılamamasına neden olabilir.
- Kurumsal web sayfalarının hacklenmesi durumunda kurum web sitesinde yapılabilecek bir değişiklikle kitleler yanlış bilgi ile yönlendirebilir ya da web sitesine koyulabilecek illegal sayfalarla prestij kaybına neden olunabilir.
- Elektronik arşivlere sızılarak tarihi belgeleri değiştirebilir ya da adliye kayıtları ile oynayarak suçsuz kişileri suçlu olarak gösterebilir (Peker, 2010).

Ülkemizde internet üzerinden yapılan terörist faaliyetler, kullanıcının tespiti zor olduğu için internet kafeler üzerinden yapılmaktadır. Aynı şekilde hakaret ve şantaj içerikli e-postalar ve sahte ihbarlar yine internet kafeler üzerinden yapılmakta, oturum ve kullanıcı takibi yapmayan ve güvenlik kamerası olmayan denetimsiz yerlerden yapılan bu saldırılarda failin tespiti güçleşmektedir (Bilek, 2012).

Çalışmanın Önemi

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Bu çalışmada Bilişim Suçları ile ilgili genel bilgi verilmiş, Türkiye'de işlenen bilişim suçlarından bazı örnekler ele alınmış ve 2011-2014 yılları arasında Kırşehir ilinde meydana gelen bilişim suçları analiz edilerek değerlendirilmeye çalışılmıştır. Bilişim yolu ile işlenen dolandırıcılık suçlarına ait örnekler ele alınarak neredeyse hayatımızın her alanında iç içe bulunduğumuz bilişim teknolojilerini kullanırken daha bilinçli ve daha dikkatli olma yönünde kamunun bilinçlendirilmesi amaçlanmıştır. Billişim teknolojilerindeki göz alıcı ve hızlı gelişimin, bilişim yolu ile işlenen suçların sayısını ve niteliğini hangi yönde etkilediğini göstermesi açısından olgu sunumu haline getirilmiştir. Ayrıca bu çalışma, kamunun bilinçlendirilmesi amacıyla yaşamımızın her alanında vazgeçilmez birer unsur haline gelen internet, cep telefonu, bilgisayar gibi teknolojilerin nasıl etkili bir suç aleti haline geldiğini ve dolandırıcıların haksız kazanç elde etmek için hangi yol ve yöntemleri kullandıklarını göstermesi açısından da önem arz etmektedir. Özdemir, Kaya Kalkan, Türkoğlu, Varol, & Tokdemir (2013)'nde belirttiği gibi bilişim alanında faaliyet gösteren kişilerin, eğitimin farklı seviyelerinde ne kadar bilinçli oldukları ve bu konudaki yaklaşımlarının neler olduğunun belirlenmesi bu bağlamda önem arz etmektedir.

Ülkemizde işlenen bilişim suçlarının hukuki boyutlarını ele alan (Atalıç Taş, 2010, Hekim & Başıbüyük, 2013, Kaya, Bilgin, Koçak, Aktaş, & Kaygısız, 2013), çalışmaların çok fazla olmasına karşın bu tür suçların önlenmesi ve tedbir alınması ile ilgili olarak bilişim alanında yapılmış çok fazla çalışmaya rastlanamamıştır. Bu yönü ile de Dijle & Doğan (2011)'nın da belirttiği gibi bu konu ile ilgilenen araştırmacıların sadece hukukçular olmaması gerektiğinden çalışmanın bilişim alanında yapılmış olması ayrıca önem arz etmektedir.

Bu araştırmadaki veriler Kırşehir İl Emniyet Müdürlüğünün ilgili birimlerinin arşiv kayıtlarındaki bilişim suçlarına ilişkin 11 olay incelenerek elde edilmiştir.

Kırşehir'de Meydana Gelen Bilişim Suçları Örnekleri

Örnek:13.11.2014 günü işyerinde kullandığı telefonu çalan müşteki, telefonu açtığında kendisini polis olarak tanıtan bir şahıs "Balıkesir ilinden geldiklerini, oğlumdan boşanmış olan gelinimin fuhuş çetesine karışmış olduğunu, bu çeteyi yakalamak için, para çekip, kendilerinin talimatı doğrultusunda hareket etmem gerektiğini söyleyerek" kendisinden cep telefonu numarasını istemişlerdir. Kullanmış olduğu cep numarasını söylediğinde şahıslar kullanmış olduğu numaradan arayıp, "müştekinin yakınlarının isimlerini zikrederek, X Bankasında bulunan parasını çekip, verilen talimat doğrultusunda hareket etmesini, cep telefonunu kapatmamasını" söyler. Telefondaki kişinin tanıdıklarının isimlerini zikretmesi üzerine, şahsa inanıp, X Bankası'ndan 13.11.2014 günü 19.000 TL para çekmiştir. Parayı

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bankadan aldığında kırmızı, beyaz poşet içerisine koyup telefondaki kişiye bankadan parayı çektiğini söylemiştir. Telefondaki şahıs arabaya binmesini Özbağ istikametine doğru seyir haline geçmesini söylemiştir. Müşteki Özbağ istikametine hareket ederek Özbağ Ankara istikameti çıkışında benzinlikte durmuştur. Yaklaşık 15 dakika kadar sonra telefondaki şahıs tekrar Kırşehir istikametine dönmesini, döndükten hemen sonra para poşetini yolun kenarına bırakmasını ve hastaneye geçmesini söylemiştir. Müşteki parayı bırakıp, oradan yavaş bir şekilde Kırşehir istikametine doğru hareket etmiş, Özbağ girişine kadar aynadan parayı bıraktığı yere gelen birilerinin olup olmadığını kontrol etmiştir. Ancak kimse gelmemiştir. Hastanede park yerinde yaklaşık 15 dakika kadar beklemiş ve tekrar aramışlardır. Telefondaki kişi müştekinin işyerine gitmesini, saat:13.45 de tekrar arayınca X Bankasına gelmesini söyleyip telefonu kapatmıştır. Bir süre şahısların aramasını bekleyen müşteki arayan kimse olmayınca ve aynı kişilerin ev telefonunu da aramış olduğunu öğrenince dolandırılmış olduğunu anlayıp, polise haber vermiştir.

Örnek:29.11.2014 günü sesinden bayan olduğu anlaşılan şahıs X isimli internet servis sağlayıcı şirketinden aradığını ve daha önce görüşmüş olduğumuzu, Kasım ayında abone olacağınızı söylemiştiniz ve hala üye olmak istiyorsanız diyerek nüfus kâğıdı fotokopisini söyledikleri numaraya faks gönderilmesini istemiştir, mağdur kişi ise kimlik fotokopisini söylemiş oldukları numaraya fakslamış, kısa bir süre sonra durumdan şüphelenerek kendisini arayan numarayı aramıştır, ancak kimse telefona cevap vermeyince akabinde X şirketinin müşteri hizmetlerini arayarak durumu beyan etmiş, müşteri hizmetleri kendisine böyle numaralarının olmadığını söylemiştir. Kimlik bilgilerinin kötü amaçlı kullanılmasından korkan müşteki (suçtan zarar gören kişi) Polis'e haber vermiştir.

Örnek: Müşteki X Bankasına ait kredi kartını kullanmakta iken, müştekiye ait 0522 222 22 22 nolu hatta tanımadığı 0850 000 11 22 nolu hattan "Maxi fırsat düzenli kredi kartı kullanmanızdan kazandığınız hattınıza ücretsiz tanımlanan 200 TL'nizi aktifleştirmek için hemen 0212 111 22 00 nolu hattı arayın" şeklinde bir mesaj geldi ve müşteki kendine ait cep telefonundan verilen 0212 111 22 00 nolu hattı aradı. Şahıs müştekinin X bankasından kullanmakta olduğu kredi kartının üzerindeki numaraları vermesi gerektiğini bu numaraları verdiği takdirde mesajda 200 TL lik kazancın devreye gireceğini söyledi, Müşteki şahsa üzerine basa basa benden para çıkacaksa böyle bir şeyi kabul etmeyeceğini dile getirdi. Müşteki ile kendisi ile konuşan şahsın X bankasının müşteri hizmetleri görevlisi olduğunu sanarak kredi kartının üzerindeki numaraları ve güvenlik numarasını şahsa söyledi ve sonra

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telefonu kapatıp şahıs ile konuşurken her hangi bir şekilde internetten alışveriş yada sipariş vermedi. Müşteki telefonu kapattıktan sonra aradan 5 dakika geçtikten sonra, müştekiyi X bankasından aradılar ve müştekinin kullanmış olduğu ve kısa süre önce üzerindeki numaraları verdiği kredi kartından 970 TL'lik internetten üzerinden telefon satan bir siteden alışveriş yapıldığı ve karttan çekildiği söylendi.Müşteki ise daha önce aradığı numarayı tekrar arayarak her hangi bir siparişinin olmadığını neden bu parayı çektiklerini sordu ve "beni dolandırdınız, sizi şikayet edeceğim" diye konuşunca telefondaki şahıs paranın geri iade edileceğini söyledi kısa süre sonra 0850 000 11 22 hattan müştekinin telefonuna yapılan alışverişin iptal edildiğini bildiren başka bir mesaj geldi ancak aradan geçen süre içinde müştekiden çekilen para tekrar iade edilmedi,Bunun üzerine müşteki bankaya gidip kredi kartını iptal ettirdi.Müşteki aradığı numarayı kendi imkânlarımla araştırdı, "……. Mecidiyeköy / İstanbul" adresine ulaştı. Müşteki İstanbul'da yaşayan bir yakınını ilgili adrese gönderdi, orada müşteki ile telefonla görüşen şahısların X ile Y isimli şahıslar olduğunu ve bu iş yerinin sorumlusu olduğunu öğrendi. Müştekiye yine paranı iade edeceğiz şeklinde taahhütte bulundular ancak aradan geçen süre içinde parayı göndermediler. Müşteki'de kendisini asılsız taahhütler ile dolandıran bankadan parayı çeken şahıs yada şahıslardan şikayetçi oldu.

Örnek:23.09.2014 günü saat: 14.00 sıralarında müştekinin kullanmış olduğu telefonunda kayıtlı olmayan bir cep telefonu numarasından kullanmış olduğu0 588 888 88 88 numaralı hattını aranarak, telefonun karşısındaki erkek şahıs, kendisini "İstanbul X Bankası Genel Müdürlüğünden aradığını ve kullanmış olduğu X Bankasına ait kredi kartının 12 hanesini kendisine söyleyip son 4 hanesini teyit etmesini istedi. Karşılığında müştekinin kart aidatını iade edeceğini söyledi. Müşteki ise son 4 haneyi şahsa söylemiş ve Kartın arkasında bulunan CV numarasını da vermiştir. Fakat müşteki kartına ait herhangi bir şifre vermemiştir. Müşteki 14.10.2014 günü saat:14.00 sıralarında X Bankası Kırşehir Şubesine kredi kartı borcunu ödemeye gittiğinde 938 (dokuz yüz otuz sekiz) TL borcunun olduğunu öğreniyor ve Hesap ekstresini aldığında 23.09.2014 günü İstanbul İli Beşiktaş İlçesinden bir ATM den 290(ikiyüz doksan)USD Doları karşılığı 666,91(altıyüzatmışaltı virgül doksan bir)TL paranın çekilmiş olduğunu öğreniyor. Müşteki 14.10.2014 günü de kullandığı kredi kartını iptal ettirmiştir. Müşteki kendi rızası dışında kullanılan kredi kartından 290(ikiyüz doksan)USD Doları karşılığı 666,91(altıyüzatmışaltı virgül doksan bir)TL parayı çeken kişi ya da kişilerden şikâyetçi oluyor.

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Örnek:Müşteki annesi özürlü olduğu için bakımını yapmak üzere babasının evine gitmiştir.Bu adrese ait ev telefonunu 0386 666 66 66 numaradan ismini bilmediği bir şahıs arayarak kendisini polis olarak tanıtmış ve kuyumcu soygunu olduğunu müştekiye söyleyerek müştekiye ait kimliğin terörist örgütüne ait şahısların içinde bulunduğunu ve kimliğinin çalınmış veya kaybolmuş olabileceğini bu durumun yanlışlıkla olabileceğini bu durumu düzeltmek için evde ziynet eşyaları olup olmadığın sormuş.Müşteki'de olduğunu söylemiş ve ayrıca kimliği ile ilgili herhangi bir sorunun olmadığını belirtmesine rağmen şahsın kendisi ikna ederek evde bulunan ve müştekinin kendisine ait olan 3 adet altın bilezik, 2 adet altın alyans yüzük, 1 adet küpe, 500 tl parayı bir poşete koyup müşteki ile buluşmaya gelecek olan polis olduğunu belirttiği şahsa vermek için dışarıya çıkmış bu sırada müştekiye ait 0598 765 43 21 olan cep telefonu arayarak sürekli görüşme halinde kalmış ve bu şekilde müştekiyi telefondan yönlendirerek ….caddesi üzerinde ismini bilmediği bir işyerinin önünde beklemesini söylemiş ve yanına gelecek olan şahsa poşeti vermesini söylemiştir.Müşteki arkasını döndüğünde esmer 35 yaşlarında bıyıklı 175-180 boylarında üzerinde siyah bir kumaş mont mavi kot pantolon iki renkli sütlü kahve gibi bir ayakkabısı olduğunu söylediği şahıs müştekiye ismi ile hitap ederek poşeti istemiş müştekide kendisine polis kimliği olup olamadığını sormuş şahısta cebinden siyah bir cüzdan çıkarmış ancak müşteki ikna olmadığını söyleyince bu sırada telefondaki şahıs bana "elindeki poşeti çabuk ver diyerek " bağırmış müştekide sinirlenip telefonu kapatmış bu esnada müştekinin yanındaki şahıs uzaklaşmış müştekide 155 polis hattını arayarak yardım istemiştir.Müşteki kendisi kandırmaya çalışarak altınlarını almaya çalışan telefonda konuştuğu şahıs ve yanına gelerek altınlarını teslim almaya çalışan şahıstan şikayetçi oldu.

Örnek:01.11.2013 günü müştekiyi ev telefonundan, bir şahıs arayıp, kendisinin emniyetten aradığını, komiser olduğunu, savcı ile görüştürüleceğini söylemiştir. Bu esnada telefondan telsiz sesleri duyuluyordu. Kendisini savcı olarak tanıtan kişi, "X bankasından iki memurun bir de kuyumcunun adına kredi kartları çıkarttığını, şahıslarla ilgili operasyon yapılacağını, bu olayın gizli olduğunu, kimseye söylememesi gerektiğini, bankaya para yatırması gerektiğini, bu yatırdığı paraları sonra tekrar iade edeceklerini" söyledi ve cep telefonunu da istedi. Cep telefon numarasını verince şahıs müştekiyi kullanmış olduğu cep telefonunu arayıp, yönlendirmiştir. 31.10.2013 günü müşteki Y Bankası döviz hesabımdan 3100 Euro parasını çekmiştir. Ayrıca 7 çeyrek altınını da bozdurmuştur. Toplam 9.000 TL civarında parayı şahısların söylemiş olduğu kart numarasına parça parça yatırmıştır. Daha sonra başka bankaya yönlendirilmiş, yönlendirildiği bankanın ATM sinden para yatıracağım

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esnada, oraya gelen polis memurunun uyarması ile dolandırıldığını anlamıştır. Polis'e başka banka hesabına da para yatırdığını söylemiştir. Tekrar diğer bankaya gittiklerin de, paranın yatırıldığı karttan paranın çekilmiş olduğunu ve kartın kapatılmış olduğunu öğrenmiştir ve Polis'e başvurarak mağdur olduğunu söylemiştir.

Örnek: Müşteki Son 6 aydır televizyonlarda ve gazetelerde reklam yapan Dr. M.E'dan telefon yoluyla ve ofislerinden çeşitli tarihlerde ve sayılarda ilaç almış, 24.12.2013 günü saat: 14.41 sıralarında X numaralı hat kendisini arayarak Dr. M.D olarak tanıtan şahıs Dr. M.E ile görüştüğünü 6 aydır müştekinin gördüğü tedavinin son aşaması olarak dizlerinde kullanması için ilaç göndereceklerini söylemiş müşteki de arayan şahsın sürekli ilaç almış olduğu Dr. M. E'ın çalışanı olduğunu düşünerek tamam deyip adresimi vermiş ve daha sonra şahıs telefonu kapatmıştır.28.12.2013 günü saat: 10.46 sıralarında müştekinin kullanmakta olduğu telefon X numaralı hat arayarak ilaçları kargoya verdiklerini kargoda adreste yanlışlık çıktığını söyleyerek tekrar adresini istemiştir. Müşteki de adresini tekrar söylemiş akabinde şahıs telefonu kapatmıştır. 28.12.2013 günü saat: 14.57 sıralarında müştekinin kullanmakta olduğu telefon Z numaralı hat kullanıcısı arayarak kendisinin kargocu olduğunu adına kargo geldiğini, kendisinin şuan evin önünde olduğunu söyleyerek telefonu kapatmıştır. Bunun üzerine müşteki kapıyı açtığın da karşımda A Kargo çalışanı adına gelen paketi vermiş kargonun karşı ödemeli olduğunu 150 TL vermesi gerektiğini söylemiş müşteki de kargoyu kargocunun yanında kontrol etmeden almış ve 150 TL parayı kargocuya vermiştir daha sonra eve girmiş kısa bir süre sonra üzerinde,GÖNDERİCİ NATURAL SPECİAL SİFALI DOĞAL KARIŞIMLAR ..... BULVARI Cd. APT. NO: .. - KONAK-İZMİR 0607 5122832 ibareleri bulunan alıcısı müştekinin olduğu kargo paketini açtığında paketin içerisinden ilaçlar yerine 4 kutu çay çıkmış bunun üzerine saat: 15.26 sıralarında kargocuyu arayıp kargonun içinden çıkanların ilaç olmadığını çay olduğunu söyleyerek parasını geri istemiş kargocu ise kendisinin yapacağı bir şey olmadığını şubeye gelip görüşmesi gerektiğini söylemiştir. Bunun üzerine müşteki A kargoya gitmiş burada bir bayan ve bir erkek çalışan ile görüşmüş kendisine yapabilecekleri birşeyin olmadığını kargoyu geri alamayacaklarını ve parayı veremeyeceklerini söyleyip istediğin yere şikâyette bulunabileceğini söylemişleridir. Bunun üzerine müşteki çalışanlara parayı gönderici firmanın hesabına yatırdıklarına dair makbuz vermelerini istemiş ancak şahıslar makbuzda vermemişlerdir, Daha sonra müşteki kendisini ilk arayan Dr. M.D i aradığında telefonun kapalı olduğunu görmüş, adres teyidi için arayan numarayı da defalarca aramış ancak cevap alamamıştır. Bunun üzerine Polis Merkezine giden müşteki, kendisini dolandıran gönderici firmadan davacı ve şikâyetçi olmuştur.

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Örnek:19.11.2013 günü içerisinde müşteki'ye ait ********** numaralı hattı tanımadığı X numaralı hattan müştekiyi aramışlar, telefondaki erkek şahıs kendisini Baş komiser olarak tanıtmış, müştekiye telefonda internetten hesaplarına girildiğini, şahısların peşinde olduklarını, bu şahıslara suçüstü yapacaklarını bu nedenle vereceği TC'sine para yatırması gerektiğini söylemiş, müşteki de şahsın dediklerine inanmış ve kendisini yönlendirmesiyle Y TC numaralı A.D adına Z bankası Iğdır şubesine parayı yatırması gerektiğini kimseye polis dâhil bir şey dememesi gerektiğini operasyonun çok gizli olduğunu söylemişler, müşteki'den 19.200 lira para yatırması gerektiğini söyleyip, bu parayı, polis aracılığı ile kendisine şahısları yakaladığı zaman tekrar iade edeceklerini söylemişleridir. Müşteki de şahsa inanarak, üzerinde kendisini Baş komiser olarak tanıtan şahsın söylediği miktar yoktu bu nedenle ilk önce U bankasına gidip oradan ihtiyaç kredisi çekip, daha sonra telefondaki aynı şahsın yönlendirmesiyle ilk verdiği TC numarasına göndermemesini başka bir TC vereceğini oraya parayı göndermesini söylemiş ve şahıs müştekiye N TC numaralı İ.K isimli şahsa İstanbul Gazi Osmanpaşa Küçük köy şubesi Z bankası hesabına göndermesini istemiş müşteki de şahsın telefonla yönlendirmesiyle Z bankasına gidip orada vezneden, ikinci verilen TC numaralı şahıs İ.K isimli şahıs adına, toplam 19200 lira göndermiş ve yaklaşık 76 TL de masraf çıkarılmış, toplam 19276 bin lira parayı göndermiştir, telefondaki şahıs müştekiye telefonu kapatmaması gerektiğini ısrarla söylemiş, ancak saat 17 den sonra operasyonunun bittiğini söyleyip biraz sonra parayı sana göndereceğiz diye söyleyip telefonu kapattırmışlardır, bir süre sonra müşteki polis merkezine gidip, operasyondan bilginiz var mı diye sormuş, ancak polis merkezinde yapılan görüşmede, dolandırıldığını anlayıp, dolandıran şahıs yâda şahıslardan ŞİKÂYETÇİ olmuştur.

Örnek:23.08.2013 günü müşteki sosyal medya adresinde gezinmekte iken, 189 TL (Yüz Seksen Dokuz)olarak görmüş olduğu X marka telefonun reklam sayfasına girerek formu doldurmuştur. 24.08.2013 günü kendisini ismini vermeyen bir erkek şahıs tarafından aranmış ve T.C. kimlik numarası istenmiştir, kendisi de şahsa inanıp T.C. kimlik numarasını vermiştir, bunun üzerine şahıs sipariş etmiş olduğu cep telefonunun 26.08.2013 günü kargoya verileceğini söylemiştir. 28.08.2013 günü kargosu gelen müşteki kargo parasını kapıda ödeyip cep telefonunu teslim almıştır. Evin içerisine girip paketi açtığında sipariş vermiş olduğu X marka telefon yerine Y marka kutu çıkmış, kutuyu açtığında içerisinde Demo olarak tabir edilen oyuncak telefonun çıktığını görünce Polis'e başvurmuştur.

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Örnek:29.08.2013 tarihinde internet kullanmakta olan müşteki bir sayfaya gezerken 149 TL'ye X marka cep telefonu reklamını görmüş, sepete atıp işlemi yapıp cep telefonu numaramı vermiştir. Siparişte vermiş olduğu telefonunu 0212 XXX XX XX numaralı telefondan çağır gelmiş, arayan şahıs telefon siparişi vermişsiniz adres bilgilerini almıştır. Müşteki 03.09.2013 günü kargoya gidip149 TL parayı yatırıp kargoyu teslim almıştır. Kargosunu açtığında, bir cinsel içerikli sprey çıktını gören müşteki Polis'e başvurmuştur.

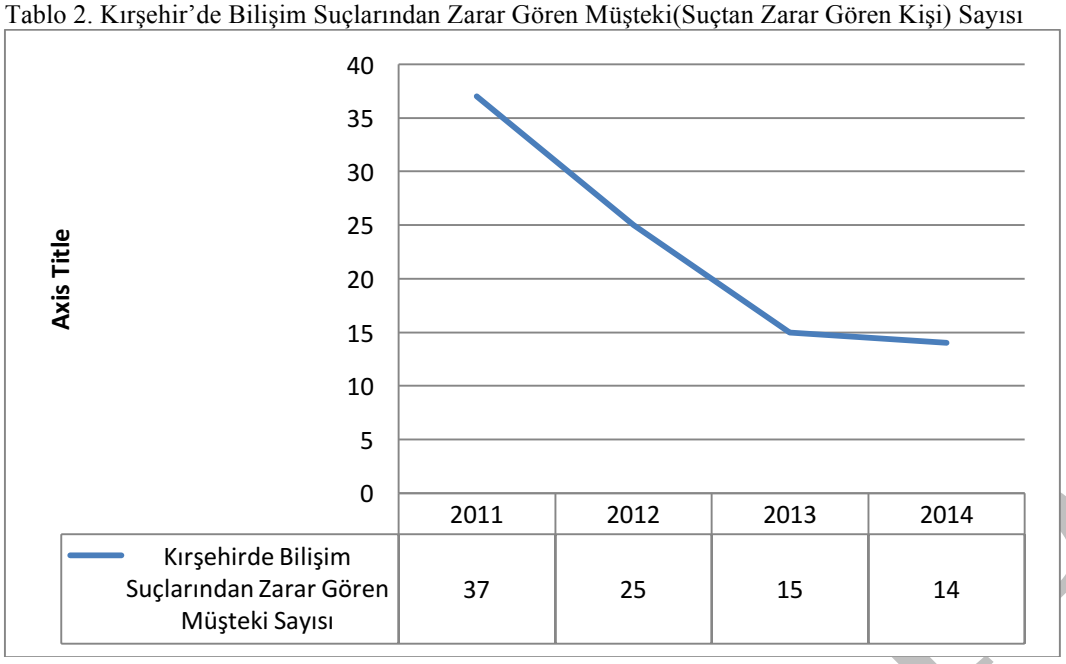
Örnek:18.11.2013 günü müştekiyi arayan X adlı şahıs, kullanmış olduğunuz internet hattına terör örgütlerinin girmiş olduğunu, terör örgütü üyelerinin yakalanması için kendilerine yardımcı olunmasını istemiştir. Cep telefonla müştekiyi yönlendirmiştir. Önce adliyeye gitmesini, telefonunun takip edildiğini, açık olmasını istemiştir. X adlı şahıs müşteki adliyenin girişine geldiğinde, bankadaki hesabına el konulmaması için parasını çekmesini istemiştir. Müştekide banka hesabında bulunan 6.300 TL parayı çekmiştir. X adlı şahış müştekiden parayı söylemiş olduğu bankadan Z isimli şahıs adına yatırmasını söylemiştir. Parayı yatırdığında müştekinin bankada beklemesini istemiş ve şahıslardan birinin yakalandığını, 8.000-10.000 TL para yatırması durumunda ikinci şahsında yakalanacağını söylemiştir. Bu konuşma sonrasında dolandırılmış olduğunu anlayan müşteki hemen banka veznesine gidip, işlemi iptal ettirmek istemiştir. Ancak paranın çekilmiş olduğunu öğrenmiştir ve hemen Polis'e başvurmuştur.

Bulgular

Araştırma sonucunda elde edilen verilerin istatistiksel analiz sonuçlarına aşağıda yer verilmiştir.

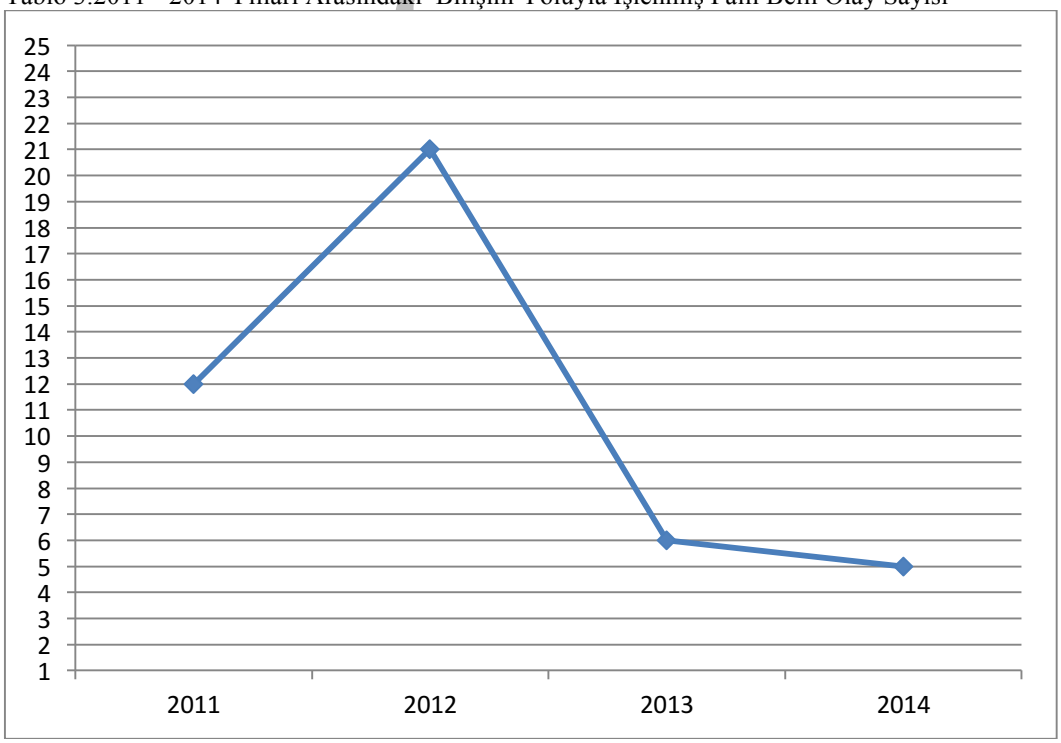
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Tablo 2. Kırşehir'de Bilişim Suçlarından Zarar Gören Müşteki(Suçtan Zarar Gören Kişi) Sayısı



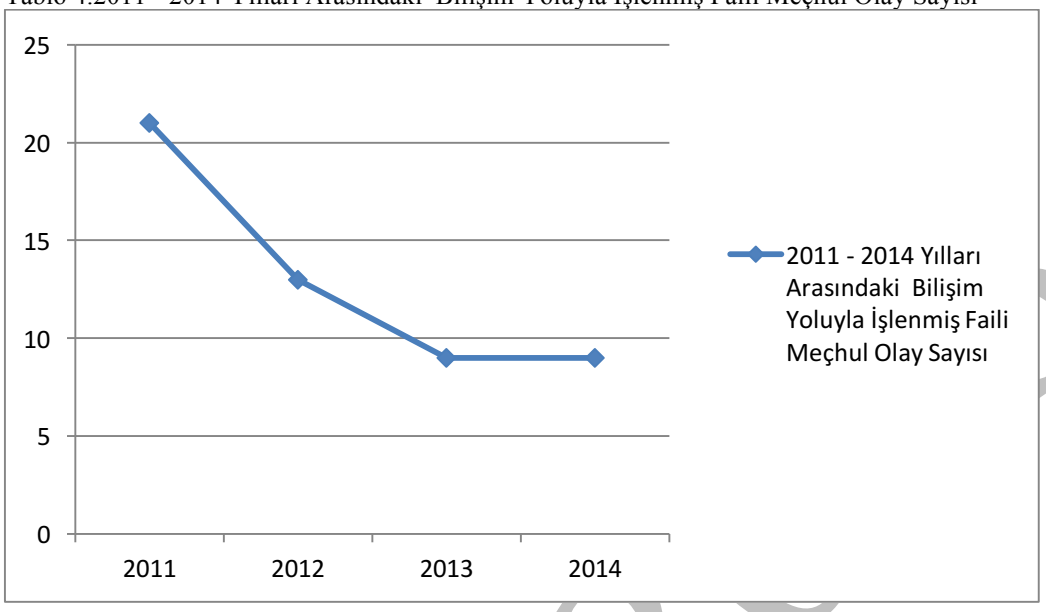
Tablo 1'de Kırşehir'de bilişim suçlarından zarar gören kişi (müşteki) sayısı verilmektedir. 2011 yılında 37 kişi, 2012 yılında 25 kişi, 2013 yılında 15 kişi, 2014 yılında ise 14 kişi bilişim suçuna maruz kalmıştır. Her geçen yıl Kırşehir'de bilişim suçlarından zarar gören kişi sayısıında azalma gözlenmiştir.

Tablo 3.2011 - 2014 Yılları Arasındaki Bilişim Yoluyla İşlenmiş Faili Belli Olay Sayısı



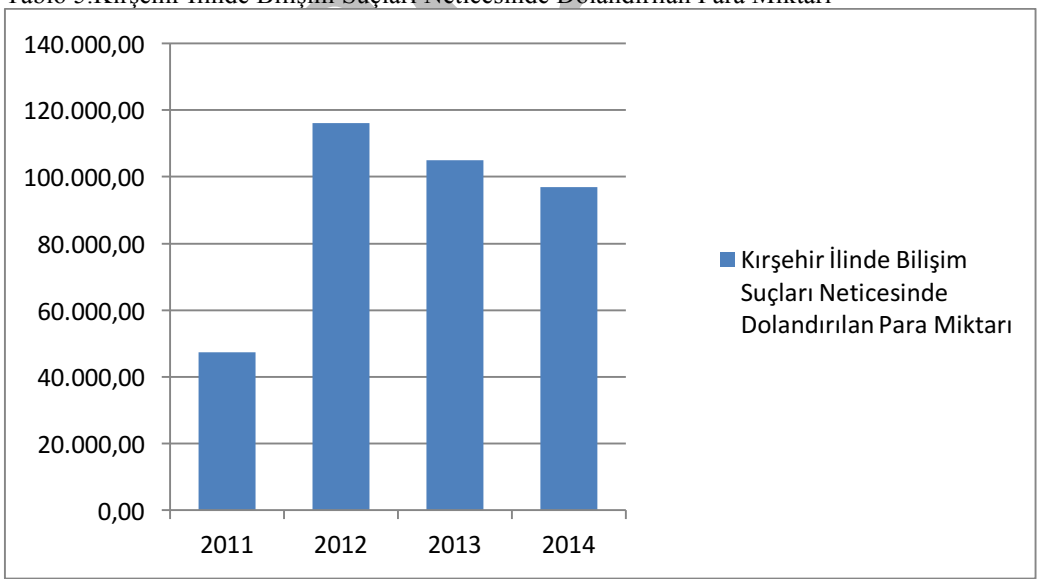
Tablo'da görüldüğü üzere Kırşehir'de 2011 yılında 12, 2012 yılında 21, 2013 yılında 6 ve 2014 yılında 5 adet faili belli olay meydana gelmiştir. Bilişim yolu ile işlenen olaylardan faili belli olan olayların sayısı son yıllarda bariz bir şekilde azalmıştır.

Tablo 4.2011 - 2014 Yılları Arasındaki Bilişim Yoluyla İşlenmiş Faili Meçhul Olay Sayısı



Tablo'da görüldüğü üzere Kırşehir'de 2011 yılında 21, 2012 yılında 13, 2013 ve 2014 yılında 9 adet faili meçhul olay meydana gelmiştir. Kırşehir ilinde bilişim yoluyla işlenmiş faili meçhul olay sayısı da son yıllarda büyük oranda azalmıştır.

Tablo 5.Kırşehir İlinde Bilişim Suçları Neticesinde Dolandırılan Para Miktarı



Tablo'da 2011-2014 yılları arasında Kırşehir'de meydana gelmiş bilişim suçları neticesinde dolandırılan para miktarı görülmektedir. 2011 yılı içerisinde toplam 47.500 TL, 2012 yılı içerisinde toplam 116.030 TL, 2013 yılı içerisinde toplam 105.000 TL, 2014 yılı

içerinde toplam 97.000 TL haksız kazanç elde edilmiştir. Yıllara göre 2012 yılından itibaren dolandırılan para miktarında azda olsa bir düşüş olmasına rağmen dolandırılan para miktarı oldukça yüksektir.

Sonuç Ve Öneriler

Günümüzde etkili ve yaygın kullanım alanıyla İnternet, dünya üzerinde milyarlarca insana hizmet vermektedir. İnternet ve teknolojinin sunduğu diğer haberleşme alt yapılarını kullanan cihazlar vasıtasıyla, sağlık hizmetlerinden bankacılık ve sigorta işlemlerine, alışverişten vergi ödemeye kadar birçok alanda insanlar bu platformlardan faydalanmaktadırlar. Dünyayı bir örümcek ağı gibi saran bu devasa haberleşme ağı, ulusal ve uluslararası ticari ya da resmi kurum ve kuruluşları birbirine bağlamakta, ticari ve sosyal bağlar bu sistemler üzerinde kurulup işletilmektedir (Bilek, 2012). Teknolojinin gelişmesi, bu teknolojiye erişimin kolaylaşması ve toplumun her kesiminden insanın ilgisini çekmesi insanların işlerini kolaylaştırmasının yanında yeni suç türlerinin de ortaya çıkmasına neden olmaktadır.

İnternet ortamında sanal arkadaşlıkların kurulması ve alışverişlerin yaygınlaşması ile birlikte bilişim suçları kapsamındaki doladırıcılık, sabotaj, özel hayatın gizliliğinin ihlali gibi pek çok sanal suç ortaya çıkmıştır.

Bilişim suçları, takibi şikayete bağlı olan suçlardandır. Para kaybının büyük olmadığı durumlarda veya bankaların suçun oluşmasında sorumlu olarak paranın bir kısmını ödemesi sonucu kişi şikâyette bulunmayınca ve bankaların da itibarını kaybetme korkusu yüzünden bildirimde bulunmaması sonucu suçların pek çoğu açığa çıkmamaktadır (Atalıç Taş, 2010).

Bilişim teknolojilerindeki gelişmelere paralel olarak bilişim suçlarının sayısı da artmıştır (Dijle & Doğan, 2011;Kaya ve diğ., 2013). Teknolojiye ve internete erişimin daha kolay olması ve daha az maliyet gerektirmesi ve internet ortamında bilişim suçu kapsamındaki uygulamalar hakkında çok fazla bilgi bulunması bu alanda suç işlemeyi daha da kolay hale getirmektedir.

Bu çalışmada hangi suçların bilişim suçlarına dâhil olduğu, bu suçların anayasamızdaki yaptırımı ve 2011-2014 yılları arasında Kırşehir ilinde meydana gelmiş bilişim suçları ele alınmıştır.

Atalıç Taş (2010)' da Adana ilinde 2006-2009 yılları arasında meydana gelen bilişim suçlarını incelediği bir araştırmasında Türkiye genelinde ve Adana'da her yıl bir öncekine oranla artış gözlemlediğini belirtmiştir. Kırşehir'de meydana gelen bilişim suçlarında ise 2012 yılı itibari ile azalma gözlemlenmeye başlanmıştır. Kırşehir'de en çok işlenen bilişim suçunun telefon dolandırıcılığı olduğu belirlenmiştir. Kırşehir'de bilişim suçlarından zarar gören kişi (müşteki) sayısı en fazla 2011 yılında 37 olay ile gerçekleşmiştir. Kırşehir'de en fazla faili belli olay sayısı 2012 yılında 21 olay ile gerçekleşmiştir. Kırşehir'de en fazla faili meçhul olay sayısı 2011 yılında 21 olay ile gerçekleşmiştir. Kırşehir'de işlenen bilişim suçları neticesinde 1 yılda en fazla dolandırılan toplam para miktarı 116.030 TL ile 2012 yılı olmuştur. Kırşehir'de 2011 den bu yıla kadar geçen sürede bilişim suçu oranı azalmasına rağmen dolandırılan para miktarında artış görülmüştür. Kırşehir ilinde bilişim yolu ile işlenen suçların çoğu bireyseldir.

Hayatı kolaylaştıran teknolojik ürünler yeni suç işleme yöntemlerinin de ortaya çıkmasına sebep olduğundan bu ürünler bilinçli bir şekilde kullanılmalıdır. Bilişim suçları ile mücadele kapsamında bilişim sektöründeki uzman personelin eğitimine ve bilgi donanımına çok önem verilmelidir. Suçla mücadele hakkında TV, gazete, dergi gibi yayın kuruluşlarınca seminerler düzenlenmeli, dergiler, afişler basılmalı ve halk bilinçlendirilmelidir.

Kamunun bilişim suçları konusunda bilinçlendirilmesi sadece bu işin hukuki boyutunu ortaya koyarak mümkün olmayabilir, bilişim teknolojilerinin (bilgisayar, internet, cep telefonu vs.) etkili kullanımının da öğretilmesi ile bilişim suçlarının daha kolay önüne geçilebilir.

Bilişim suçlarının önlenmesinde en etkili çözüm insanların kullandıkları bilişim teknolojileri ile ilgili ayrıntılı bilgiye sahip olmalarıdır. Dolayısı ile bu konuda emniyet güçlerinin, hukukçuların ve bilişim sektöründe çalışanların işbirliğinde kamuyu bilgilendirecek seminer ve konferansların verilmesi bilişim suçlarından mağdur olan insanların sayısını da azaltacaktır. Bölgesel veya ülke genelini kapsayacak araştırmalar yapılarak daha genel sonuçlar elde edilebilir. Ayrıca bilişim suçları ile ilgili bilişim sektöründen daha fazla bilimsel araştırmaların yapılarak bilişim suçlarının farklı bir boyutunun da incelenmesi bilişim suçlarının önlenmesinde rol oynayacaktır.

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BİR PROGRAMLAMA ÖĞRETİM ARACININ, "PROGRAMLAMA" DERSİNİ ALAN ENDÜSTRİ MÜHENDİSLİĞİ ÖĞRENCİLERİ ÜZERİNDEKİ ETKİSİ

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Özet

Bu çalışma, programlamaya yeni başlayanların ilgi ve motivasyonlarını arttırmak için kullanılan bir programlama öğretim aracının endüstri mühendisliği öğrencileri üzerindeki etkisini tespit etmeyi amaçlamaktadır. Bu maksatla, Endüstri mühendisliği birinci sınıfındaki "Programlama Laboratuarı I" dersini alan 42 adet öğrenciye Google Blockly ile program oluşturma ödevi verilmiştir. Daha sonra öğrencilere, ödev hakkında bir anket uygulanmıştır. Ankete katılan öğrencilerin %83,3'ü ödevin ders için faydalı olduğu, %73'ü derse olan ilgilerini arttırdığını ve %86,5'i algoritmik düşünme yeteneklerine katkı sağladığını belirtmişlerdir. Öğrencilerin ödevde oluşturdukları toplam KSS (kod satırı sayısı) ile ödevin kavramsal içeriğine uygun olan dersin ilk sınavının başarı puanları karşılaştırıldığında aralarında istatistiksel anlamda pozitif yönde bir ilişki olduğu gözlemlenmiştir. Elde edilen bulgulara göre; kullanılan programlama öğretimi aracının endüstri mühendisliği öğrencilerinin programlama dersine olan ilgi ve motivasyonlarını arttırdığı ve ders başarısına olumlu yönde etkisinin olduğu değerlendirilmiştir.

Keywords: Programlama öğretimi araçları, google blockly

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THE IMPACT OF A PROGRAMMING TEACHING TOOL ON INDUSTRIAL ENGINEERING STUDENTS TAKING "PROGRAMMING" COURSE

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Abstract
Aim of this study is to measure the impact of a programming teaching tool, used to increase the interest and motivation of beginners to programming, on industrial engineering students. For this purpose, program coding using with Google Blockly assignments were given to 42 students at the "Programming Lab I" class as homework. Then, they were asked to complete a questionnaire about the assignments. 83.3 % of the participants found that the assignment was helpful for the course, 73% reported that it increased their interest the course and according to 86.5 % responded the assignment contribute to their algorithmic thinking skills .The LOC (Line of Code) created by students in the their assignments was compared to the achievement scores of the first exam of the course that include the same content the assignment. A positive correlation between two was observed. When the results evaluated, the programming teaching tool that allow students to increase their motivation-interest and it impacts positively success of the students at course.

Keywords: Programming teaching tools, google blockly

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Giriş

Programlama, bilgisayar bilimlerinin temel öğelerinden birisidir. Genelliklede programlamaya giriş dersleri ile başlanır. Yeni başlayan öğrenciler programlama becerilerini geliştirirlerken ciddi zorluklarla karşılaşmaktadırlar. Yeni başlayanların birçoğu programalamanın en temel noktalarını kavrayamaz hatta en temel programları dahi üretemez (Tan et all., 2014). Özellikle öğrenmenin başlangıç aşamasında öğrencilerin yeterince ilgisi çekilemeyip yukarıdan aşağı tasarım denilen mantıksal kurgu tam olarak aşılanamazsa sonraki aşamalarda öğrencilerin zayıf olmasına ve dersten kalmalarına neden olmaktadır. Üniversitelerde programlamaya giriş dersini bırakma oranları %20-%40 gibi yüksek oranlarda olmaktadır (Kinnunen, Malmi, 2006). Başarısızlık oranlarıda ortalama %30'lar civarındadır (Benedsen, Caspersen, 2007). Başkent Üniversitesi Mühendislik Fakültesi'nde programlamaya giriş dersi bütün mühendislik bölümleri tarafından (Bilgisayar, Biyomedikal, Elektrik-Elektronik, Makine, Endüstri) alınması zorunlu bir derstir. Her sene ortalama 250 öğrenci bu derse kayıt olmaktadır. Birinci sınıf dersi olduğu için öğrenciler dersten çekilemezler. Devamsızlıktan kalanlar ile başarısızlıktan kalanların sayısının, toplam derse kayıt olan öğrencilerin sayısına oranı ortalama %33 civarındadır.

Programlamaya giriş dersinin başarısızlık-bırakma nedenlerinin başında motivasyon eksikliği gelmektedir (Kinnunen, Malmi , 2006). Günümüzde öğrenme ve öğretme süreçlerini destekleyen, öğrencilerin ilgi ve motivasyonlarını arttıran pek çok eğitsel araç bulunmaktadır. Programlama eğitimlerinde de kullanılan çeşitli elektronik araçlar bulunmaktadır. Bu araçlar öğrencilerin öğrenme deneyimlerinin zenginleştirilmesinde önemli rol oynayabilirler. Bu araçların başında Alice, BlueJ, Jeliot, Scratch ve Greenfoot gibi araçlar gelmektedir (Salleh et all., 2013). Bahsedilen araçlar görsel programlama dilleridir. Bu araçların en popüler olanıda Scratch programlama dilidir. Scratch, bilgisayar programlamayı herkes için daha kolay anlaşılabilir yapmayı amaçlamaktadır (Resnick et all., 2003). Google Blockly (developers.google.com/blockly), Scratch dilinden etkilenerek hazırlanmış bir görsel programlama ortamıdır. Programcı blok benzeri şekilleri sürükleyip bırakarak programını oluşturabilir. Oluşturulan görsel program koda dönüştürülerek çalıştırılır (Ashrov et all., 2014).

Programlama öğretimi ve öğrenimi üzerine araştırmalar giderek artmasına rağmen özellikle kullanılan programlama araçları üzerine yapılan araştırmalar azdır (Salleh et all., 2013). Özellikle görsel programlama dillerinin programlamaya yeni başlayan mühendislik öğrencileri üzerindeki etkileri üzerine çalışmalara rastlanmamıştır. Bu çalışmanın amacı görsel bir programlama öğretim aracının, programlamaya yeni başlayan endüstri mühendisliği öğrencileri üzerindeki etkisini tespit etmektir.

Yöntem

Programlama Laboratuarı I dersi, programlamaya giriş dersinin uygulama içeren parçasıdır. Bu dersin üçüncü haftasında giriş dersine paralel olarak algoritma kavramlarına giriş yapılırken ödev olarak Code.Org (www.code.org) projesinde yayınlanan "K-8 Bilişim Teknolojilerine Giriş" dersinin ikinci , beşinci ve yedinci seviyeleri ödev olarak verilmiştir. Bu seviyeler, Google Blockly kullanarak program yazdırmayı hedeflemektedir. Öğrencilere diğer seviyeleride isterlerse yapabilecekleri duyurulmuştur. Code.org üzerinde "BIL105-04" olarak şube açılmış ve "K-8 Bilişim Teknolojilerine Giriş" dersi varsayılan ders olarak tanımlanmıştır. Daha sonra öğrencilere şubenin web bağlantısı ve sisteme girebilmeleri için gereken "gizli kelime" şifreleri öğrencilerin e-posta adreslerine gönderilmiştir. Sisteme giren öğrencilerin tamamladıkları seviyeler, ürettikleri KSS (kod satır sayısı) gibi istatistiki bilgiler öğretmen ekranından izlenmiştir.

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Bulgular

Öğrencilere, ödevin derse olan katkısını ortaya koymayı amaçlayan, evet-hayır cevap seçenekleri olan bir anket uygulanmıştır. Ankete katılan öğrenci sayısı 37'dir ve katılanların tamamı verilen ödevi yapmışlardır. Ankete katılan öğrencilerin %35,1'i kız, %64,9'u erkektir. Ankete katılanların yaş aralığı 18-27 aralığında olup ortalaması 19,91'dir. Verilen cevaplar Tablo 1'de gösterilmiştir.

Tablo 1. Anketteki sorulara verilen cevapların dağılımı

Soru	Evet	Hayır
Verilen ödev ders için yararlı mı?	%83,3	%16,7
Ödev derse olan ilginizi arttırdı mı?	%73,0	%27,0
Algoritmik düşünme yeteneğinize katkısı oldu mu?	%86,5	%13,5
Ödev, derse olan korkunuzu azalttı mı?	%48,6	%51,4

Ödevde, öğrencilerin geçtiği seviyeler ve seviyelerde ürettikleri kodların toplam satır sayısı değerleri öğretmen panosundan takip edilebilmektedir. Dersin ilk sınavı, öğrencilere verilen ödev ile aynı bağlama sahiptir. İlk sınavdan alınan notlar tespit edilmiştir. Öğrencilerin sınav sonuçları ve ürettikleri toplam KSS değerlerine ilişkin açıklayıcı istatistikler Tablo 2'de verilmiştir.

Tablo 2. Sınav ve toplam KSS ilişkin açıklayıcı bilgiler

Değerler	Ortalama	Standart sapma	Enküçük	Enbüyük
Sınav	44,07	29,16	0	88
KSS	233,05	187,894	0	951

Hem sınav sonuçları hem de KSS değerleri normal dağılım göstermektedir. İkisi arasında ilişki tespiti yapmak için Pearson korelasyon testi uygulanmıştır. Testin sonuçlarına göre Pearson korelasyon değeri 0,330 ve p=0,033 olarak hesaplanmıştır. %95 güvenirlik seviyesinde öğrencilerin sınav başarı puanları ile ürettikleri toplam KSS değerleri arasında istatistiksel anlamda pozitif yönde bir ilişki olduğu söylenebilir.

Sonuç Ve Öneriler

Programlamaya giriş dersleri, bilgisayar bilimlerinin önemli derslerinden birisidir. Mühendislik fakültelerinde de tüm mühendislik öğrencileri tarafından alınması zorunlu derslerden birisidir. Maalesef öğrencilerin yeterince motive edilememesi, başlangıçtaki bazı eksiklikler öğrencileri başarısızlığa itmektedir. Bu tür dersleri daha ilgi çekici hale getirmek, öğrencileri motive etmek için gerekli öğretim araçlarını bulup kullanmak da ders verenler olarak öğretim elemanlarının üzerine düşmektedir. Code.org sitesi üzerindeki, Google Blockly uygulamaları bu maksatla derste ödev verilerek uygulanmıştır. Ödevden sonra öğrenciler üzerinde yapılan ankete göre; öğrencilerin %83,3'ü ödevin ders için faydalı olduğu, %73'ü derse olan ilgilerini arttırdığını ve %86,5'i algoritmik düşünme yeteneklerine katkı sağladığını belirtmişlerdir. Maalesef ödev tek başına öğrencilerin derse olan korkularını azaltmaya yetmemiştir. Öğrencilerin %51,4'ü ödevin derse olan korkularının azalmadığını belirtmişlerdir.

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Öğrencilerin ödevde oluşturdukları toplam KSS (kod satırı sayısı) ile ödevin kavramsal içeriğine uygun olan dersin ilk sınavının başarı puanları karşılaştırıldığında aralarında istatistiksel anlamda pozitif yönde bir ilişki olduğu gözlemlenmiştir. Bu bulgulara göre kullanılan programlama öğretimi aracının endüstri mühendisliği öğrencilerinin programlama dersine olan ilgi ve motivasyonlarını arttırdığı ve ders başarısına olumlu yönde etkisinin olduğu değerlendirilmiştir.

Gelecek çalışmalarda bilgisayar, elektrik-elektronik gibi diğer mühendislik öğrencileri veya başka programlardaki öğrenciler üzerindeki etki analizleri yapılarak birbirleri ile karşılaştırılabilir. Cinsiyete göre farklılıklar incelenebilir. Google Blockly yanında diğer öğretim araçlarıda denenerek hangileri ile daha iyi sonuçlar alındığı incelenebilir.

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Calculators Vs Computers: Assessing The Effects Of Different Teaching Strategies On Student Performance

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Abstract
The purpose of this research is to compare and assess student performance through the usage of calculators and computers in an engineering mathematics classroom. For this study, 72 second-year electrical engineering students from a public university in Malaysia were grouped into two separate classrooms to solve several basic numerical problems. The use of calculators was compared to computers equipped with MATLAB software in mathematics-based classrooms and the students' performance in solving the problems were then analyzed.
The study found that the majority (96%) of students surveyed believed that calculators were a necessary part of their studies, but between the different technologies – calculators and computers – there was barely any significant difference in terms of academic performance. In addition to that, 92% of the students sampled are reported to have said that calculators are more helpful in doing mathematics as compared to computers. There is also no evidence to suggest gender difference in the usage of computers and calculators in mathematical achievement. Although most of the students surveyed claimed to own personal computers, their usage of computers are admittedly mostly constrained to personal non-academic matters whereas the usage of computers for mathematical problem-solving ranked lowest in their list of priorities. This study found no significant difference in performance between the two surveyed classes; hence concurring with the King and Robinson (2012) study on calculators.

Introduction

There are many different factors affecting students' performance in a mathematics class. One such factor is instructional strategy (Cazden, 1986; Herring, 1996; Herring et. al., 1992). The use of technology in education, particularly, has been extensively employed within recent times as part of the teaching strategy. Technology in the form of supercomputers[1] that can handle very large databases or do a great amount of computation (or both) are used extensively in many scientific and engineering environments.

A correlative study to assess the affect that the use of calculators by educators made on student achievement was carried out by Jacobs-Miller (2013) in a seventh-grade mathematics class and the results denoted a significant correlation ($r=0.26$, $p=0.001$) between such use of calculators and individual mathematics achievement. The theoretical framework behind Jacobs-Miller's study was structured around Matusevich's theory that technology could enhance constructivist learning. Although some mathematics classrooms do not require the use of calculators, it is by and far a necessity for numerical analysis classes. In a typical numerical mathematics setup, for example, teachers will present their students with a problem

together with its analytical method such as least square method, interpolation method and Runge-Kutta method to find the solution.

Further, Li and Ma (2010) indicated that there were significant positive effects of computer technology on mathematical achievement. Li and Ma (2010) conducted a meta-analysis of 85 independent effect sizes extracted from 46 primary studies involving a total of 36,793 learners. Expanding on this idea, Tuluk (2014) carried out a study on preservice teachers attending a state university where a pretest and a posttest were given and it was found that Computer Algebra Systems (CAS) was influential on preservice teachers' usage of CAS. In addition to this, Tajuddin et. al. (2009) studied the role played by graphing calculators on sixteen-year old Malaysian secondary students and found that it enhanced student performance. Their [Tajuddin et. al. (2009)] study was designed in such a way that the experiment group underwent learning using graphing calculators while the control group underwent learning through conventional instruction.

Compared to Tuluk's (2014) study on CAS, Jacobs-Miller's (2013) study on calculators, and the analysis of correlations between technology and mathematical achievement by Tajuddin et. al. (2009), this research examines the different technology that is available for use vis-à-vis mathematical achievement.

This said, where mathematical engineering classes are concerned, technology such as computers is still very seldom incorporated and explored to their full potential. Teachers are generally still inclined to rely solely on the use of scientific calculators; dismissing the use of computers in their teaching. The reason behind this neglect is because of the difficulty and meticulousness that computers typically present.

The Study

In this study, 72 second-year electrical engineering students in a public university were grouped into two separate classrooms to solve such basic numerical problems as previously mentioned. The use of simple technology such as calculators were compared to the use of computers. The computers in the computer laboratory were equipped with MATLAB software and the results of the study were then analyzed.

A questionnaire was developed to determine the biographical data of the students, the students' prior academic achievement, as well as their perceived ability to use computers for programming. In addition to all this, students were asked to answer several Likered-scaled

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questions from a scale of 1 (strongly disagree) to 5 (strongly agree) regarding their perception on the use of calculators and computers both in classroom and real-world application. By incorporating the study done by Tajuddin et. al. (2009), one group was given weekly tutorials and assignments in MATLAB while the other group was not given any help in computer programming in MATLAB or otherwise. The group that was given tutorials is reported to have a higher degree of programming ability than the group without tutorials. At the end of the eight-week period, both groups were given a standard assessment on numerical problems whereby one group may use only calculators while the other had the option of solving the given assessment through either calculators or computers. The results of the assessment were then compared between the two groups.

Findings

Looking at the data quantitatively, there were 54 male students and 18 female students surveyed. From the survey, 20 students reported to have used only calculators in their studies, 9 students reported to have used only computers, while the majority (42 students or 58.33%) of the students surveyed reported to have employed both calculators and computers in their engineering class [see Table 1].

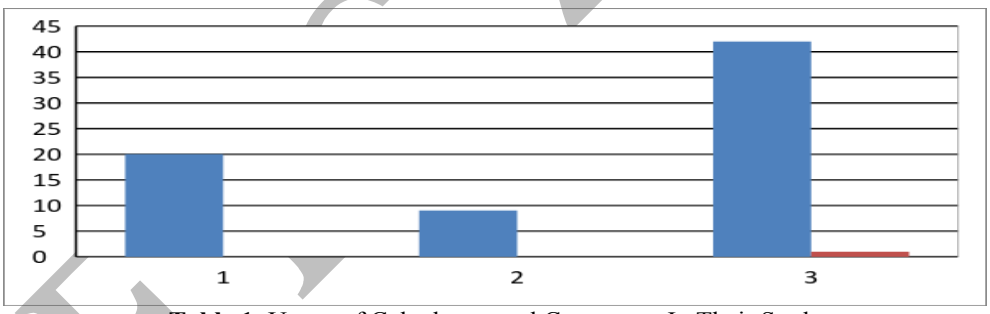


Table 1: Usage of Calculators and Computers In Their Study

As students' performances in Malaysian universities are generally measured through a cumulative grade point average (CGPA) system, this study shall thus use CGPA as the basis to quantify students' prior academic achievements. As seen in Table 2 below, 54 (75%) of the students' CGPA fall between the 2.51-3.5 range. In terms of academic performance, these two classes were above average in their achievement. It is to be noted, however, that among the students sampled, the male students rather significantly outperformed their female counterparts.

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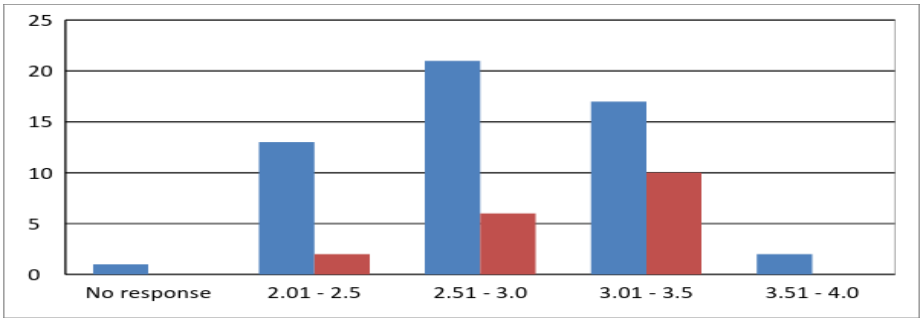


Table 2: CGPA between gender

As mentioned earlier, the purpose behind this study is to determine the effect of different teaching methods on second-year engineering students. The first method is to teach one set of students solely through the use of calculators and the second method is to teach the second set of students with either calculators or computers. A standard assessment on the numerical problems were given to the two groups and the results of the assessment were compared and analyzed.

However, when the data of the mathematics achievement test were analyzed between the genders, this study supported the null hypnosis that there is no significant difference between genders in mathematics achievement ($p=0.378$), see Table 3 below. This study is in contrast with the studies conducted by Kyriakides and Antoniou (2009) and Geist and King (2008) where they were reported to support the hypothesis that males tended to outperform females on the hardest items and females tended to outperform males on the easiest items for their two longitudinal studies with 4 different age group of primary school students. Having said this, this study is thus supportive of the data from the National Educational Longitudinal Study of 1988 where it was found that there was no gender difference in mathematics achievement but noteworthy difference favoring males were found at the end of the score distribution. Studies done by Isiksal and Cakiroglu (2008), on the other hand, found that there was no gender difference in mathematical achievement when they studied 2647 middle school students in Turkey. They also found that socio-economy was not a critical factor in mathematics achievement.

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	Gender	N	Mean	*t*-value	*p*-value
Mathematics Achievement	Male	54	2.821	-0.887	0.378
	Female	18	2.956		

Table 3: Mathematics achievement between gender

Table 4 below shows the difference in mathematical performance between the two groups studied. The null hypothesis is that there is no difference between the two teaching strategies. As displayed in Table 4 below, there is no significant relationship (p-value = 0.424) between the set of students sampled to employ only calculators and the group tested through computers with mathematics achievemnet. This said, there is, however, a slight shift in average test results where the class tested with computers show a slight better average and those being tested with calculators.

This study concurred with the Davis-Langston (2012) dissertation which found that there were no significant relationships between elementary school teachers' teaching styles and students' achievements in mathematics. Based on TIMSS 2007 assessment on mathematics achievement in eight-grade students in Korea, also, House and Telesa (2013) found that besides instructional practices, there were other significant factors associated with the high-test scores typically earned by Korean students on international scales. One such factor was the frequent engagement in independent learning activities by the typical high-scorer in Korea's education system.

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	Technology	N	Mean	*t*-value	*p*-value
Mathematics Achievement	Calculator	38	2.804	-0.804	0.424
	Computer	34	2.411		

Table 4: Different Technology on Mathematics Achievement

Unlike Jacobs-Miller (2013), Li and Ma (2010), Tuluk (2014), and Tajuddin et. al. (2009)'s finding that there is significant correlation between teachers' use of technology and students' achievements in mathematics, this study found no significant difference between the different technologies employed and mathematical achievement. Having said this, it is arguable that this study does not, in fact, contradict with the study conducted by Tuluk (2014) on CAS, Jacobs-Miller (2013) study on calculators, Tajuddin et. al. (2009) on graphing calculators, as well as the meta-analysis study done by Li and Ma (2010) as, to be fair, there were no other alternative technologies employed or distinguished in their research.

Technology	Mathematics Acievement	No of Students	*Chi-Square*	*p*-value
Calculator	D	1	1.219	0.875
	C	6		
	B	15		
	A	12		
	A+	2		
Computer	D	1		
	C	14		
	B	11		
	A	8		
	A+	2		

Table 5: Different Technology on Mathematics Achievement

Further analysis using the chi-square test also showed that there is no significant relationship between the usage of calculator and computer with mathematics achievement, see Table 5 above. However when compared to Table 4 above, the average mathematical achievement for the class tested with calculators is a B+ (2.804) as scaled on a bell curve whereas the average score for the students tested with computers is slightly negatively skewed towards a C+ (2.411) average. In addition, the number of students with an A grade in the classroom employing calculators in their study is reportedly higher than the number of students with a grade A in a computer class. The general underlying assumption that information and communication technology (ICT) should be introduced in schools to produce greater impact on students' performance as both asserted by members of the public and supported by Hammond (2014) makes, in reality, no more than merely a modest impact in schools.

Besides the standard assessment, students were also asked several Likered-scale-type questions. When asked whether 'Calculators help me in my studies', 50 (69.44%) students reported that they strongly agree with the statement. The mean score is for this item is 4.67. When asked 'In mathematics class, I need to use calculators more than computers', 65% of the students strongly agree with this statement while the mean score is 4.46. In addition, when asked 'Computers help me in my studies', nine (12.5%) students reported that they strongly agree with the statement the mean score is for this item is 1.96. Similarly, when

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asked 'In mathematics class, I need to use computers more than calculators', 1% of the students strongly agree with this statement while the mean score is 1.07. Almost all of the students (95.8%) responded favorably to the question 'Calculators are a necessary technology for my studies?' with a mean score of 4.47. In contrast, only 30.5% responded unfavorably to the question 'Computers are a necessary technology for my studies?', with a mean score of 1.72. The results of this survey therefore show that students believed that calculators are more important than computers in their studies.

Students were asked to determine whether the computer or calculator is more helpful in doing mathematics. The results were tabulated in Table 6 below. Noticeably in this table, 66 (91.6%) students reported to have answered that calculator were more helpful in doing mathematics compared to computers. A majority of them (29 students) supported their answers with the belief that calculators were easier to use than computers; 15 students said rationalized, on the other hand, that calculators were a bigger help than computers because they were portable/handy, while 9 students said that they believe calculators to be less prone to error.

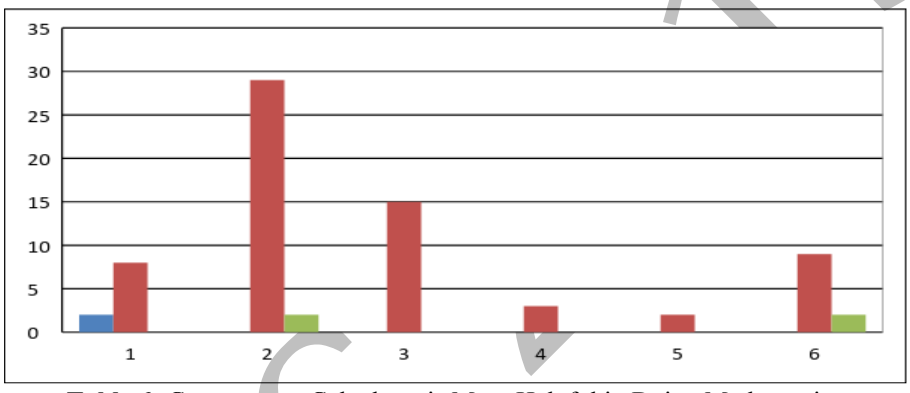


Table 6: Computer or Calculator is More Helpful in Doing Mathematics

In contrast to what the students believed, however, a majority (90%) of the class surveyed owned a personal computer [see Figure 1].

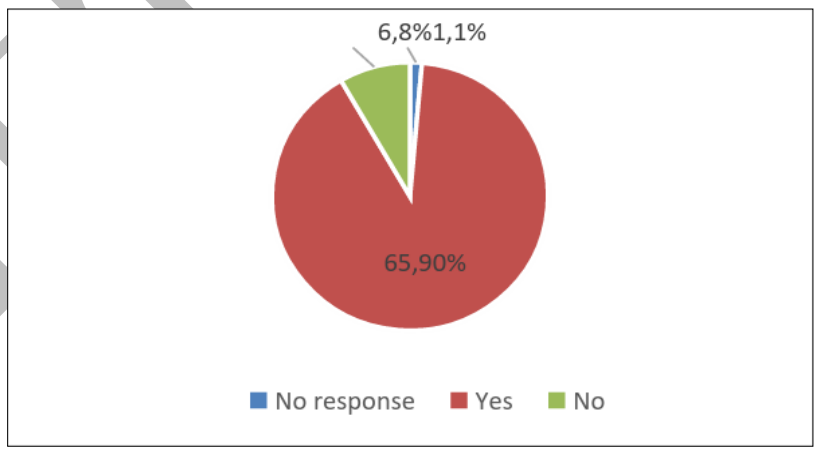


Figure 1: Owned a Personal Computer

In the questionnaire, students were further asked to rank the primary usage of their personal computers between the given value of 1 (most usage) to 5 (least usage). The results tabulated from this study found that personal computers were mostly used for the students' personal non-academic work (mean rank score =1.44), internet non-academic work (mean

rank score= 2.81) and, last of all, mathematics related work (mean rank score =3.47). These results are displayed in Table 5 below.

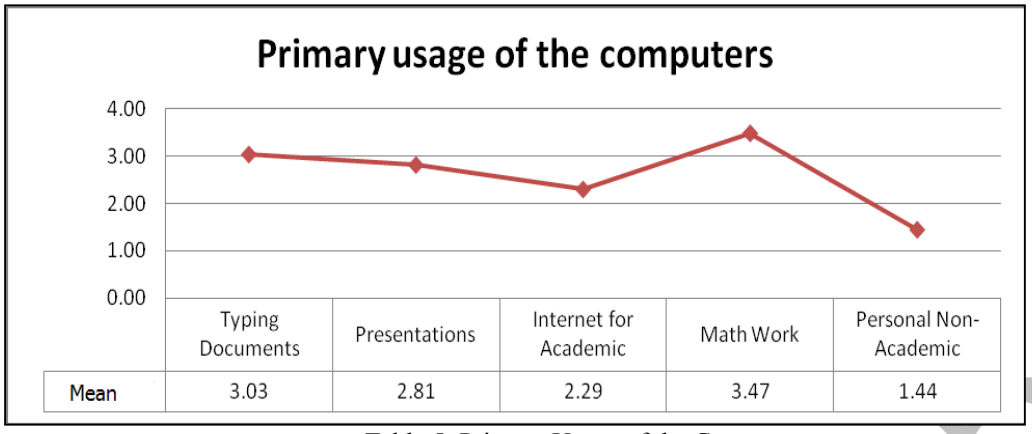


Table 5: Primary Usage of the Computers

Conclusions

As there are so many factors affecting mathematical achievement (Khalid, 1997), this study examined the different strategies of teaching that could possibly enhance students' performance in mathematics. This study found that there are no significant differences between the two types of technologies sampled –calculators and computers – for second year electrical engineering students at a Malaysian public university mathematics class. There is also no evidence to suggest gender difference in the usage of computers and calculators in mathematical achievement. Students in this study were above average in their academic performance and they believed that the calculators are much more helpful in their studies than computers. Although most of the students owned personal computers, their usage of computers is mostly constrained to personal non-academic matters while the usage of computers in mathematical classes ranked lowest in their list of priorities. This empirical study looked at higher education students but it remains to be seen whether the results would be different should computers be incorporated much earlier in the students' mathematics curriculum.

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Collaborative Learning: Interactive Debates Using Padlet In A Higher Education Institution

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Abstract
Teaching the advantages and disadvantages of ICT can be boring and unchallenging to students. Hence, a lesson was designed for interactivity and collaboration using *Padlet*. *Padlet* is an online tool and has been used for maintaining interactions and communication for collaborative learning. In this study, *Padlet* was used in a synchronous online debate among 40 students learning about computers in an institute of higher education. A survey of the usability of this tool for constructing new knowledge and for collaborative learning was done. In addition, students were interviewed to gather their opinion on the use of the tool. The findings indicated that students could learn and generate new ideas when using this tool. Hence, *Padlet* can be used for collaborative learning in the format of a debate to get new ideas. Further studies can be carried out to determine other models for using *Padlet* as an instructional tool for subjects in higher education institutions.

Introduction

The aspiration of the Malaysia Education Blueprint 2015 - 2025 (Higher Education) is to produce innovative students who have mastery of core subjects and general knowledge about the world, can solve problems by applying, creating, and connecting knowledge, as well as which use experiential and technology-enabled learning models for personalised and engaging learning experiences (Ministry of Education (MOE), 2015). Information communication technology (ICT) is believed to be important for providing quality education. Students who use ICT for learning are active and responsible for their own learning, while among academic staff, ICT use in instruction can promote a culture of innovation (MOHE, 2011).

In the institutes of higher learning in Malaysia, ICT in integrated in many of the programs offered, especially at undergraduate level. Most courses in universities are conducted using blended learning, and Massive Open Online Courses (MOOCs) is being piloted for innovative learning solutions (MOE, 2015). However, the courses in institutes of higher learning should involve not only the transmission of knowledge. In order for students to acquire skills of problem-solving, and for students to apply, create and connect knowledge, higher level thinking is required.

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This means that students in institutes of higher learning should not just be taught facts and concepts as content, but more importantly the skills of acquiring, internalizing, applying and creating new knowledge (Ronen & Pasher, 2011). Cognitive and social interactions during collaborative learning can encourage higher level thinking for creation of new knowledge among undergraduates (DeWitt, Alias, Siraj, Zakaria, 2014; DeWitt, Alias, Siraj & Hutagalung, 2014). These interactions have been shown to take place when collaborative problem-solving tasks on wikis to encourage creativity and innovation in learning at undergraduate level (DeWitt, Alias, Siraj & Hutagalung, 2014).

Although information literacy is taught in some institutions, the emphasis is on the acquisition, evaluation and the use of information to address issues and problems while there is less emphasis on teaching the creation of new knowledge (Cranfield & Taylor, 2008; Biasutti & El-Deghaidy, 2012; Martin, 2006). Hence, there is a need to further investigate other instructional models and collaborative tools which can be used for generating new knowledge among undergraduates (DeWitt, Alias, Siraj & Hutagalung, 2014).

In this study, a collaborative tool, *Padlet* is used to conduct an interactive debate among undergraduate students. The usability of the tool *Padlet* is evaluated to determine if this model of instruction could be used for instruction. Undergraduate students may be digital natives, but not all have similar ICT skills. One similarity among undergraduates in Malaysia is that all of them seem to use *Facebook* for social microblogging (DeWitt, Naimie, & Siraj, 2013). Hence, it would be useful to investigate whether other tools such as *Padlet*, can be used to create new knowledge.

Web 2.0 In Higher Education

Technology has been used for instruction with resources such as tutorials, simulations, drill and practice activities, games and exploratory environments to explore course content (Grabe & Grabe, 2004). With high speed broadband internet access, delivery of the resources has moved from storage devices such as CD-ROMs to the cloud storage, thus enabling the sharing and collaboration activities to be online, anywhere and anytime. Emerging technologies in the 21st century such as web 2.0, mobile learning and interactive surfaces have brought about new opportunities and affordances for learning (Bishop & Elen, 2014). This paper focuses on a software for an emerging technology, web 2.0.

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There are many Web 2.0 tools which are free, easy to use, and do not need hardware with high specifications to be installed on the device to run. Research on web 2.0 tools seem mainly to focus on use of blogs and wikis, perhaps because these were the earlier emerging technologies (Hsu, Ching, and Grabowski, 2014). At present, many other web 2.0 tools have been used for instruction such as *Facebook*, *Twitter*, *Youtube* for video sharing, and other collaborative document sharing tools. Hsu, Ching, and Grabowski (2014) analysed the research on web 2.0 tools and inferred that the practice of using Web 2.0 tool are for the following: publishing and sharing information on learning to show progress and achievement; collaborating on learning tasks; enabling thinking processes and products to be evidenced; communicating and disseminating information; social networking in authentic environments; and building authentic and meaningful communities of practice.

Blogs can be used for publishing and sharing information, for enabling thinking processes and for building communities of practice, while wikis can be used mainly for collaborating on learning tasks and enabling thinking processes to be evidenced (Hsu, Ching, and Grabowski, 2014). Although web 2.0 tools had rich affordances and could be used innovatively in learning and instruction, not all tools maximised the full potential of collaborative learning. This was because some of these tools were eventually used only for displaying information online, and not for collaboration or interaction. Hsu, Ching, and Grabowski (2014) suggests that the activities designed for web 2.0 should begin with having a shared goal which is common to the group and meaningful for construction of knowledge to the community.

There are many other new web 2.0 tools such as *Google+, Crocodoc, Edmodo, Bubbl.us, Prezi* and *Socratic*. Research on these tools is needed to investigate the capabilities of using these tools for collaborative learning and instruction in higher education (Hsu, Ching, and Grabowski, 2014). For this purpose, one of these tools, *Padlet*, was used for this study. *Padlet*, is a web 2.0 tool for interaction on a virtual wall and has been used for simple instructional tasks, as well as for more complicated tasks among experts (Weller, 2013; Padlet Blog, 2013). When used for collaboration and communication between deaf students and students with normal hearing,, it has been shown to be usable for learning and interaction (Dewitt, Alias, Ibrahim, Ngu, and Mohd Rashid, 2014). Documents and multimedia files from the virtual wall can be saved, copied and pasted into any other application and placed dynamically by using several techniques. It can be used for simple tasks for beginners or for expert instruction, and does not require special training (Weller, 2013; Padlet Blog, 2013).

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There seems to be not much research done on the use of models of instruction using web 2.0 tools. In addition, there does not seem to be many modules developed for teaching at higher education using design and developmental approach (Norlidah Alias, 2010; Dewitt, 2010; Vanitha Thanabalan, 2011; Ma Ping, 2012; and Muhammad Sabri & Nor Aziah Alias, & Zawawi Ismail & Nurulhuda Osman, 2012). Hence, there is a need for more studies in developing interesting instructional designs to encourage collaborative learning for higher level thinking skills.

Interactions For Collaborative Learning

Collaborative learning occurs when knowledge, skills and attitudes are acquired through group interactions (Johnson & Johnson, 2004). Collaborative learning seem to improve memory, produce fewer errors, and motivate learners (Bligh, 2000) but may be influenced by background factors, such as age, activeness and values; internal factors such as leadership and communications; and consequences on the rationale for collaboration, will influence the group interactions (Tubbs, 1995). The discussions for collaboration on solving the task enabled the learners to form a learning community with a shared goal for knowledge building (Johnson & Johnson, 2004; Kuo, Hwang, Chen, & Chen, 2012; Palloff & Pratt, 1999).

Cognitive interactions in online learning platforms can enable the learning of concepts and principles as learners build knowledge, while social interactions engage and motivate learners in the learning activity (DeWitt, Alias, Siraj, & Zakaria, 2014). In a study among 30 undergraduate students who used discussion forums for learning, a large proportion of cognitive interactions (46.0%) were seen, which indicated that they were learning during the collaboration (DeWitt, Alias, Siraj, & Zakaria, 2014). In addition, the students perceived that discussion forums were effective for collaborative learning (60.0%) and enabled ICT and communication skills (16.7% each), as well as self-regulated learning skills (13.3%) to be developed. This indicates that interactions on collaborative tools may be useful for learning (DeWitt, Alias, Siraj, & Zakaria, 2014).

Collaborative tools have been shown to be useful for learning. In the Collaborative mLearning (CmL) module prototype, students were able to use the collaborative tools: wiki, discussion forums and text messaging, to increase interactions in learning the language of science (DeWitt, Alias, & Siraj, 2014a). The CmL module was used for peer support to

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scaffold learning (Boticki, Looi, & Wong, 2011; Timmis, 2012), generate ideas (So, Tan, & Tay, 2012), and knowledge-creation (Palloff & Pratt, 1999; Rogers, Connelly, Hazlewood, & Tedesco, 2010). Collaborative learning enables learning experiences to be interpreted for the construction of knowledge (DeWitt, Siraj, & Alias, 2014b).

Interactions that enable the process of meaning-making in science (Sharma & Anderson, 2009; Tubbs, 1995). As learners interact, both face-to-face and online, and reflect on their discussions, a learning community for sharing learning experiences is built (So & Bonk, 2010, Palloff & Pratt, 1999). Dialogue and interaction internalizes learning (Gredler, 1997; Schunk, 2000). Cultural tools such as computers and mobile phones; and abstract social tools, such as language, assist in developing the learners' thinking. CMC tools enable cognitive change in the learner as ideas are exchanged and debated upon to create new knowledge (Gredler, 1997; So & Bonk, 2010; So, Tan, & Tay, 2012; Rogers, Connelly, Hazlewood, & Tedesco, 2010; Zhu, 201;).

A collaborative problem-solving task can enable knowledge management processes for encouraging creativity and innovation in learning at undergraduate level using wikis (DeWitt et al. 2014). A knowledge management framework is used to evaluate the value of the interactions. This is because in KM processes of knowledge acquisition, knowledge internalisation, knowledge creation, knowledge sharing, and knowledge application enable knowledge to be transformed (Kappes & Thomas 1993).

The use of ICT and web 2.0 tools such as *Padlet*, enable enables information to be accessed for knowledge acquisition and then transferred into an effective representation in the minds of the learner through internalization (Dalkir, 2011, Kappes & Thomas 1993; Vásquez-Bravo, Sánchez-Segura, Medina-Domínguez, & Amescua, 2013). The tactic knowledge which is highly informal, personal, unverbalized, intuitive and derived from experience, is modelled into explicit knowledge which is more formal and systematic, and expressed through writing, mental maps and externalized to be published shared in the community using different tools (Dalkir, 2011, Kappes & Thomas 1993; Vásquez-Bravo, Sánchez-Segura, Medina-Domínguez, & Amescua, 2013).

The process of collaboration and interaction enables the application and transfer of knowledge through the sharing of experiences among the members of the community

(Vásquez-Bravo, Sánchez-Segura, Medina-Domínguez, & Amescua, 2013). The creation of new knowledge occurs when the personal explicit knowledge of the members is combined into the explicit knowledge of the community and organization by means of categorizing, reclassifying and synthesis of existing knowledge (Vásquez-Bravo, Sánchez-Segura, Medina-Domínguez, & Antonio Amescua, 2013). There is a need for more research on Web 2.0 tools to to explore emerging technolgies and to determine if these tools could improve learning.

The Study

In this study a collaborative learning tool, *Padlet*, was used in an instructional model for a course for undergraduate students in a public university. During the implementation, the learning process was observed to determine whether new knowledge was created using the knowledge management processes as the framework of the study. The research questions are as follows:

- To what extend does the processes of acquiring, internalization, creation, sharing and application of knowledge occur during instruction using this model?
- What are the participants' perceptions of the interactive debate on *Padlet*?

This study employs an exploratory implementation study on the use of *Padlet* for collaborative learning among undergraduates in a public university. The sample was 40 first-year undergraduate students who volunteered to take part in the study. The students were required to know the advantages and disadvantages of ICT. In order to teach in an innovative manner, the students were given the task of a debate between 2 teams, using a technology application which was new to the students, the virtual wall, *Padlet*. The students had to post individually, and could use the application to post or link text, graphics, or videos on *Padlet*. They were given time to familiarize with the tool, and then informed of their task. The task was done in a computer laboratory where each student had access to a computer.

The task was an interactive debate on *Padlet* to debate the advantages and disadvantages of ICT. The empty wall was prepared before the task by the facilitator. The link to the wall was given to the students during the lesson. Firstly, one team was given 10 minutes to post on the virtual wall on the advantages of ICT. The postings were viewed synchronously on the wall by the other team members, who could plan their rebuttal. At the end of the time limit, the

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opponents were given 10 minutes to post the disadvantages of ICT, which was viewed synchronously as well. A second round was conducted, followed by a final conclusion round.

Procedure

On completion of the tasks, the students were given the Knowledge Management Questionnaire (KMQ). Data was also collected from interviews with the students on their perception of the task and the collaboration processes. In addition, a content analysis of the written documentation of the task on the *Padlet* was done according to the five domains of knowledge management (Kappes & Thomas 1993).

Instrument

The Knowledge Management Questionnaire (KMQ) which measures the application of Knowledge Management processes using a 5-point Likert Scale and is reliable above the 0.70 standard of reliability with a total Cronbach alpha of 0.86 (Biasutti & El-Deghaidy, 2012).

Findings

The participants were 'digital natives' who use social networking tools (all of them use the microblog, *Facebook*), but none of them had used virtual walls like *Padlet*.

Knowledge management processes

Participants perceived that they shared, applied and acquired knowledge. The analysis of the KM processes from the KMQ showed higher scores for the sharing and application of knowledge (Mean=4. 6875; S.D. = 0.46254; and Mean=4.4286; S.D.=0.57492, respectively) (see Table 1). The students had shared Knowledge: *"exchanged opinions"; "We shared opinions openly and positively with friends", "Sharing encouraged better and stronger ideas among us", "Information was rapidly shared directly with the group."* The sharing gave the learner a responsibility to ensure information posted was accurate and well-organized. In addition there was application of Knowledge**:** *"With Padlet I am able to learn to think fast",* "*The sharing with my friends enabled me to understand the issues from different perspectives", "I am able to connect all the information from my friends post to come up with important information." And these processes* led to the internalization and application of knowledge.

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Table 1: Mean and standard deviation on KM domains

Domains	Mean	Standard Deviation
Knowledge Acquisition	4.2750	.57926
Knowledge Internalization	4.1750	.50630
Knowledge Creation	4.1000	.76962
Knowledge Sharing	4.6875	.46254
Knowledge Application	4.4286	.57492

Further analysis of the individual items showed that the students scored lowest on the knowledge creation aspect as they were uncertain whether they had generated knowledge (Mean=4.100; S.D. =0.76962). However, the analysis of the interviews indicated that the students had acquired useful knowledge: "I got to learn new knowledge that was useful", "Many things I did not know, until my friends shared on the wall," and "Got to know a variety of ideas that was shared." Observation showed that the students were actively searching for knowledge using search engines such as Google. This included pictures, text, web pages and videos as shown in Figure 1.



Figure 1: Screen captures of Post on *Padlet* using text, graphic and videos.

Although the students perceive that there was low knowledge internalization (Mean=4.1750; S.D. =0.50630), there was evidence of knowledge internalization "I am able to express my ideas better" and "Able to get others viewpoint and broaden my knowledge." It was also observed that students were able to represent the knowledge acquired in different formats. The knowledge on the advantages and disadvantages of ICT had to be internalized so that new knowledge could be created among the students. Students had to use their internalized knowledge to summarize the information acquired, or to depict it in graphic form.

There was evidence of knowledge creation from the students' response: "Generated new ideas", "I thought out of the box, creatively and critically, got to train my mind to think fast and accurately." The new knowledge created was transformed and displayed in different ways. The community of learners was learning new knowledge by observing their friends posts as well.

Table 2: Padlet as a learning tool

Items	Mean	S. D.
I like to see my friends comments on *Padlet*	4.5385	0.5970
Padlet enables me to share ideas with my friends	4.7436	0.4385
Because of *Padlet*, my class members are able to reach an agreement	4.3077	0.7579
I developed new ideas from the activities on *Padlet*	4.7436	0.4935
I learned new concepts from the other posts on *Padlet*	4.4872	0.5991
I learned through collaborative learning with *Padlet*	4.5128	0.6789
The materials posted on *Padlet* were clear	3.9744	0.6405
The materials posted on *Padlet* were useful	4.2564	0.6400
The activity on *Padlet* was challenging	3.5641	1.0595
I got ideas on the advantages and disadvantages of ICT from the materials posted on *Padlet*	4.5128	0.5057

Students' Perceptions of Padlet

The students seemed to find Padlet a suitable tool for learning (see Table 2). They were interested in seeing their friends comments, and sharing on the platform (Mean = 4.5385, S. D. = 0.5970, and Mean = 4.7436, S. D. = 0.4385 respectively). Besides learning new concepts and through collaboration (Mean = 4.4872, S. D. = 0.5991, and Mean = 4.5128, S. D. = 0.6789), the students seemed to agree that they developed new ideas from the interactive debate (Mean = 4.7436, S. D. = 0.4935 and Mean = 4.5128, S. D. = 0.5057). There was less agreement on whether the activity was challenging (Mean = 3.5641, S. D. = 1.0595). This was perhaps due to the fact that the tool was easy to use.

Conclusions

The findings show that interactive debates using Padlet could be used for instruction. The students seem to agree that there was learning and sharing of information as they generated new knowledge while going through the processes of knowledge acquisition, sharing, internalization, application and creation (Dalkir, 2011, Kappes & Thomas 1993; Vásquez-Bravo, Sánchez-Segura, Medina-Domínguez, & Amescua, 2013). In addition, this was an interesting way of learning which could motivate students to learn better. This was evidenced through the many forms of knowledge generated after internalization occurred. An interesting point to note was that students in many of these studies seemed to perceive that there was little new knowledge generated, but analysis indicated that the learners were internalizing and generating new knowledge (DeWitt, Alias, Siraj, & Hutagalung, 2014; DeWitt, Alias, Siraj, & Zakaria, 2014).

Padlet was a web 2.0 tool which enabled interaction and collaboration. Hence, Padlet is a good alternative to reduce the communication gap among student teachers and peers. The use of Web 2.0 tools may indeed facilitate communication and interaction among students. As a cultural tool, Padlet provided the platform for generating new knowledge (Gredler, 1997; So & Bonk, 2010; So, Tan, & Tay, 2012; Rogers, Connelly, Hazlewood, & Tedesco, 2010; Zhu, 2012). This further proved that collaborative learning encouraged cognitive processes during the interactions as the learners acquired new ideas from knowledge shared (DeWitt, Alias, Siraj, & Zakaria, 2014; Palloff & Pratt, 1999; Rogers, Connelly, Hazlewood, & Tedesco, 2010; So, Tan, & Tay, 2012).

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Although many studies have been conducted using web 2.0 tools to investigate the learning process, there has not been many done in the Malaysian context, and studies done have mainly concentrated on discussion forums and wikis (DeWitt, Alias, & Siraj, 2014; DeWitt, Alias, Siraj, & Hutagalung, 2014; DeWitt, Alias, Siraj, & Zakaria, 2014). There is a lack of studies done to investigate the different instructional designs for learning using web 2.0 tools.

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Hence, more studies can be done to investigate the use of this free tool, Padlet, and to investigate different systems which can be used for instruction and learning in different subject areas, and for different samples.

In order to produce innovative and knowledgeable students who have higher level thinking skills, web 2.0 tools may be a possible solution. Hence, designs and models for instruction for learners to generate new knowledge and use these skills are required for instructors to be creative and effective in their teaching.

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Communicative Activities In The Teaching Of Arabic Language In Malaysian Secondary Schools

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Abstract
This is a case study which intends to look at communicative activities carried out by teacher of Arabic. The participant involved in this study are a teacher teaching Communication in Arabic and a class of Form Two students. The teacher was selected based on a number of criteria among which was knowledge regarding communicative activities and teaching experience of more than ten years. Data were collected through observation, interviews and documents within a period of four months. The results of the study revealed eleven features or criteria of communicative activities in the teaching of Arabic. These criteria for communicativeness were adapted from the communicative activity continuum used by Harmer (1983) and the principles of communicative activities by Johnson (1982). The criteria which were identified were that the activities should be those which stimulated a communicative desire and had a communicative purpose. The focus of the activities was on meaning or content which could be conveyed in a variety of structural forms. Intervention by the teacher and control by materials should be reduced. Effective communicative activities were those where there was information transfer, information gap, jigsaw activity and task dependency.
Keywords : Teaching Arabic, communicative activities, second language and secondary school.

PROBLEM STATEMENT

The goal of Arabic curriculum in Malaysia is enabling the students to communicate the language verbally in their daily lives. They are expected to achieve a good command of language skills such as listening, speaking, reading and writing but with the hope to direct much attention towards speaking. It is because due to the objectives of the subject matter which are to familiarize the students in listening and at the same time they are able to communicate fluently when conveying their on thoughts in certain situations.

In order to enable students to communicate, the opportunity to speak in the classroom should be given to them to complete the communication task that involved between each student or teacher. Allwright (1984) argues that the practice of communication skill in the classroom useful to students in order to use the language they have learned in the outside world. Commmunication in this context means, communication that involve between teachers

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and students so that they can exchange the both roles as speakers and listeners within at each other.

Regarding this, it means that communication plays as a major activities in Arabic classroom. To make this activities work teacher should give opportunities in terms of creating the enjoyable learning through communication instead of using the old fashioned strategy such as memorizing grammar rules and words. In Arabic Curriculum Specifications of student's learning experience also suggested the communicative activity to the teachers to be implemented in the classroom. Toimah (2004) brought the concept of communicative situation. It means, the situation in the classroom is a place of such training pool to prepare for facing the ocean.

RESEARCH OBJECTIVES

Objective of this research is to examine Arabic teacher instructional practices during communicative activities in the classroom. This study will potray and explain the process that occured in the classroom related with the communicative activities in teaching Arabic. Specifically, this study will try to reveal the teaching communicative activities that has been carried out by an experience Arabic teacher in a secondary school. Based on the stated objective, this study will answer the research question that is, how teacher carry out the communicative activities in teaching Arabic course?.

RESEARCH THEORETICAL FRAMEWORK

Harmer (1983) has drawn up six criteria of communicative activities as follows:

1. Desire to communicate. The activities are able to boost up student's desire to communicate. They also feel that they really need to speak and communicate.
2. The purpose of communication. Tujuan komunikasi. The activities must be in the real situation of communication and not only for the purpose of practicing the language. Therefore, there should be a gap in the information and ideas between students.
3. Content and not the structure. In carrying out the activities, students should concentrate on what they are saying and not on how well they did. Therefore, they should focus on the message to be delivered not to the structures of the language used to convey the message.
4. The variety of language structure. Activities should allow students to use various of language forms or structures. They will feel the freedom on making their own choice to use whatever language forms or structures.

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5. No intervention from teacher. This is about the activities that allow students to work with each other. Corrections or teacher assessment is the result based on the activities conducted. The assessment also should be based on student achievement in communication and not on the use of language either right or wrong.

6. No control from the materials. Activities will not control the language that will be used by the students but rather the students themselves who will choose the language that will use.

Johnson (1982) also outlined the five criteria or principles of communicative activities :

1. *Infromation Transfer Principle*. These activities involve the understanding of the information received and then they will transfer the information in different form. For example, transferring the information from graphical form to the written report.

2. *Infromation Gap Principle*. For example, communication occurs when participant A does not know what was known by participant B. In order to get the information, participant A will ask to participant B to reduce the information gap between them.

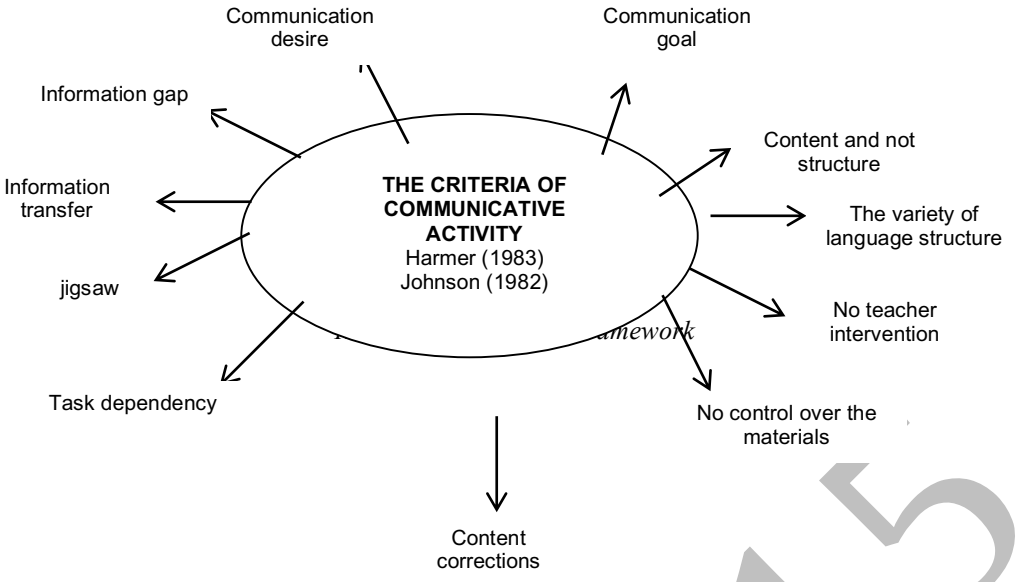
3. *Jigsaw Principle*. Activities to collect separate information to complete a task.

4. *Task Dependency Principle*. A task can only be carried out with complete other task first.

5. *Correction for Content Principle*. Evaluation from the teacher based on the student's language result while communicating in carrying out a task. But at the certain stage, teacher can correct their grammar accuracy.

As noted, this study will use the criteria set out by Harmer (1983) and Johnson (1982) as a guide to see how teachers implement communication activities. Description of the underlying theoretical framework of this study can be viewed through the following figure:

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RESEARCH METHODOLOGY

As already explained, communicative activity is a process of activities that encourage the use of communicative skills when interacting in the classroom. Therefore, we can get information about the communicative activities that occured if it can be observed from the beginning until to the final stage of the teaching process. In order to find out what factors that influence the activities that has been planned by the teachers, the process needs to be investigated. Because of that, researcher choose this qualitative method.

This study is a qualitative case study using three data collection techniques that is; observation, interviews and document. All of these three techniques developed were based on the theories approach related to the issues and problems in this study in accordance with the objectives and research questions. This study is about the practice of communicative activities in teaching Arabic language which the process that occurs in the classroom. The word 'practice' refers to the activities and behaviors that occur continuously and sequentially in the classroom. It certainly needs to go through several procedures and steps and also needs the actual and specific context. Plus, It also requires a profound observation to obtain a full descriptive explaination to illustrate that practice.

All data collected based on the teaching process which normally carried out by them. It includes direct instructions, behavior of teacher and students, written notes on the board and events that took place during the lesson. Thus, the data about teaching steps by the teacher can be obtained by the natural and not counterfeit handwritings.

The choice of research location consider to be salient in this qualitative case studies. According to Bogdan and Biklen (1998), the choice of research location is to get the place for

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researchers to collect data for the study. Jorgensen (1989) argues that the determination of the place is important for the successful of the study.

There are five main criteria in determining the choice of research location which are: (1) the purpose of the study, (2) easy to enter to the site, (3) the opportunity of choosing a class, (4), good help from school administrators, and (5) suggestion from the curriculum officer.

FINDINGS

The study found that the language communication has become the activity in the Arabic language classroom. Teacher has given opportunities to make the process of teaching and learning as something enjoyable and cheerful because it can be seen that the real communication really exists during the Arabic class activities.

These activities according to Larsen-Freeman (1986) is important because it has similar characteristics to the actual language that students are able to exchange information as well as the speakers can receive direct feedback from listeners.

How can we measure an activity is considered as a communicative activity? For that, we need to outline the characteristics or criteria associated with it. The study found there are eleven criteria must exist to ensure that the activities carried out by teacher will be considered as a communicative activity.

1. **Activities that can boost up desire to communicate**

In this study, communicative activities undertaken by teacher has led to the desire among students to communicate. For example, the second communicative activities in teaching lead the students to talk in order to know the ideas of their friends. If they do not ask questions or express their ideas they will not be able to complete the assignment given by the teacher.

Activities such as those created by the teachers in this study were able to generate internal motivation and interest to use the language. Larsen-Freeman (1986) argued that the important responsibility of teacher is to create an appropriate atmosphere to stimulate communication with the variety of role given to their students in different kind of situation in communication. In this way, students get motivated to learn something useful. Finocchiaro and Brumfit (1983) also stated that internal motivation will exist through their interest to use the language when communicate.

2. **Activities that have the purpose of communication**

The activities carried out by the teachers in this study has made the students have a goal to communicate and they must use Arabic in order to achieve those goals. The speakers have shown their result through their communication such as try to make it clear, attract their

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attentions and provide information to the listener. This makes the speakers really interested and eager to achieve their communication goals. Students who are the listeners interested to know the goal of the speakers in delivering their speech. They want to know what the speakers want to say or what are the ideas they want to deliver. The ability to identify the meaning of the communication according to Larsen-Freeman (1986) is part of the ability to communicate.

Such activities have involved the students do the actual communication and they have the opportunity to use the Arabic language. Therefore, they are able to perform the communication tasks in situation or meaningful context rather than in the design environment. Thus, the language used is a language that belongs to the students and not only to practice their language that has been taught mechanically.

3. **Focus on contents and not structures.**

The study found that when the students have their own goal in their speech, their observation towards the listeners are focused on the content was said and not to the form of the language structure used.

Speakers will select the language savings in their memory that they consider it appropriate to achieve the objectives. Listeners also will process the variety of aspects of language grammar and vocabulary to understand what is being said by the speaker.

This makes the students learning focus on what is being said and not on how to say it. Speakers and listeners will focus on the message to be delivered and not to the structures of the language used in conveying the message. This is because according to Littlewood (1984), teaching aimed at producing communication competence and not to the mastery of grammar.

4. **The variety of language structure occured.**

Students who speak in this study has used a variety of language structures in coveying their words. This means they are not tied to only one grammatical structures because, according to Larsen-Freeman (1986) a language function can be served by some of linguistic structure. To reach the goal in communication students who speak will choose the appropriate language from their vocabulary. Similarly, the listener needs to process their grammar and vocabulary they have to have good understanding of what was said by the speakers.

In teaching communicative activities conducted by the teacher in this study, the students used various forms or structures of language. They feel free to use the structure of language on their own choice. Teacher also try to deal and treat their students' language abilities.

The most important thing according to Toimah (1986) is the students are able to express the words the needed to say in appropriate way and suitable with the situation. At the same

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time, for the listeners, they are able to grasp and understand the language within the topic they discussed, words and structures.

5. **Less of teacher intervention.**

In this study, when students are conducting communicative activities, teacher reduced the interference. This is because with a lot of teacher intervention, students will get the information that they have committed many mistakes, teachers are concerned about the accuracy and therefore they need to do a lot of repetition.

As what can be seen from the study, students were given the opportunity to practice Arabic language. In this way, according to Toimah (1986) language learning can takes place by forming regular routine until it become norm and not easily to change. Krashen and Terrel (1983) also states that language acquisition can be acquired through the use of language in a meaningful way. Brumfit (1981) believes that a good classroom language teaching is to give more opportunities and exposure to the language. Therefore, Cook (1991) argues that teachers are no longer the dominant figure that can control over the students, but they need to let students take over the activities of learning by doing.

Therefore, what is done by the teacher in this study was to involve and become the part of the participant. Teacher also acted as an observer and good listener to give the feedback in controlling the class during the communication activities.

From what had been observed, teacher intervention was indirectly occured such as praise, the action of showing encouragement to let the students keep on continue to communicate and so on. This will lead to the effective communication among students. They will try to work on their own by trial and error with the least help from the teacher.

The minimum intervention was found to make the students have high confidence to communicate. This positive attitude is important because, according to Krashen and Terrel (1983) students who have high motivation, self-confidence, appearance, and low levels of anxiety have the chance to succeed to master the language.

6. **Limitation in controlling the materials and contents.**

In common language teaching, students are asked to use materials that causes them to use certain way in communicating the language. Such teaching is also usually limit the selection of students on what should be dealt with by them or how they are supposed to say. Such restriction would deprive the characteristics of language diversity.

This is in contrast to the teaching of teacher in this study, which reseracher found that the teacher reduces the language control used by students. They even can choose for themselves what kind of language they will use. This coincides with the suggestion by Toimah (2004)

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who said that the acquisition of language to communicate not through the follow-up utterances and memories recall on certain materials only but also must go through a process of understanding and the use of language structures functionally in the context of the communication.

However, there were still support system and little guidance given from teacher to the students. Like what process they have been through in ninth lesson, the teacher was giving some examples of questions and answers that can be used to find out the identity of one of the participants of communication.

This means that the focus is not on the content of teaching grammar, and the terms but to introduce various examples of the style. Such focus by Toimah (1986) in accordance with the habits of language acquisition by children who use the language before knowing the grammar system. Therefore, students should be exposed to the forms of language and examples of correct language style until they are familiar and expert on that. Brumfit (1980) felt that teacher must provide communication into their teaching practices without firstly focus on the mastery in the certain skills like sound pronounciation, grammar and vocabulary.

7. **Teacher correction towards the contents.**

The study found that corrections made by the teacher are the result of the student's communicative activities undertaken by them. The assessment based on the students achievement during the communication process. This is consistent with Johnson (1982) for correction and evaluation conducted by the teachers is the result of activities and student achievement in communicating.

For example in the eighth lesson, teachers have to make corrections only after there is a confusion between two participants. This has made the focus of the teaching is to what is said and not how to say. Corrections and assessments made not on the use of languages either right or wrong.

This is because according to Toimah (2004), the language error is necessary step and continuously in every phase of the students' acquisition in their ability to communicate. Larsen-Freeman (1986) also sees mistakes are allow and the language is seen as a natural result in the development of communication skills. This is because success is measure more to the aspect of student's fluency.

Littlewood (1984) argues that teaching is not just looking at the legality of the use of correct sentences, but rather even taking into account the contributions during the communication process takes place. Finochiaro and Brumfit (1983), however, states that the language aquired by students should be through their own efforts by trial and error.

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8. **Activities in the form of information transfer.**

In this study, teacher carried out activities that accured information transfer. Information transfer occurs when the activity involves student's understanding of the information received, and after that they can convert that information into different way. This is in line with what was stated by Johnson (1982).

For example in second lesson, eight students have to read and understand the ideas he received from the teacher. These ideas relate to the four activities during a collaborative program organized by the school administrators that is PIBG. All of the students need to convey their own idea using their own language in order to be understood by others until they can find a friend who has the same idea with them.

9. **Activities that create information gap.**

Johnson (1982) sees that good communicative activities is there is a gap between two ideas or information among the participants. Student A does not know what it is known by the student B and vice-versa. For both parties to get the information they need to ask each other.

In this study, the information gap has created a spontaneous dialogue from students which not memorization, not what was given earlier by the teacher, and not make the mechanical repetition exercises. The use of language spontaneously by Toimah (1986) is the ability of communication between students because of their ability to distinguish the functions of the various languages in which the actual situation of language use.

Larsen-Freeman (1986) argues that communicative activities need to have the information gap, preferences and feedback. Even according to Finocchiaro and Brumfit (1983), teacher or student can not know exactly what kind of language to be used by whistleblowers because the dialogue occurs spontaneously and unplanned. Larsen-Freeman (1986) goes on to state that the situation there is a gap of this information will make students exchange messages, solve problems and bridge the information gap.

Thus, Johnson and Morrow (1981) argues that the activity in the classroom is as real communication based on information gap. That is because in real life communication that occurs between two people when one knows something is, but not for the other. Therefore, the communication acts as a bridge for this information gap. But for Richards and colleagues (1985) argued that the activity without this information gap is a mechanical and unnatural.

10. **Jigsaw activities.**

There were communicative activities undertaken by teachers in this study that have elements of information or ideas that are separated (jigsaw). Students have to collect

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information or idea to execute the task that was given to them. The elements corresponding to those described by Johnson (1983).

For example, in the second lesson, there are four different ideas and separated among four students. These ideas are related to the collaborative activities in school. They should discuss together to make it clear about these ideas. Only with the comprehensive understanding of the ideas they will be able to arrange that four ideas according to the sequence of events.

11. **Task dependency activities.**

Dependency task according to Johnson (1982) is, the need of students to undertake a task that has been given by the teacher. After completion of this task, they need to solve other tasks associated with its continuity.

For example, in second lesson, eight students have to read and understand short passages of the text that has been given by the teacher. After have a good understanding on the ideas contained from the text, they have to convey the meaning to others. While presenting the idea, they need to find partners with similar ideas with them. A student must find another student who has the same idea. After the completion of the task they need to perform another task. The next task is, for each representative from the similar idea should discuss with four participants among them in order to draw up these ideas in sequence.

CONCLUSION

In conclusion, the eleven criteria of communicative activities mentioned earlier, we can identify to what extent of these activities that had been carried out were in accordance with the principles of teaching which is based on language acquisition. Among of these are the principles introduced by Littlewood (1981). These principles are the principle of communication, namely activities that involve real communication. The principle task is about the activities that can use the language to perform the meaningful tasks. The meaningful principle is, the language that being studied which consider to be meaningful to the students.

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Comparative Multicultural Education In The Era Of Globalization

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Abstract
The purpose of this paper is to shed the light on marginalization issues due to social cultural obstacles in relation to language, ethnicity, and culture; and how students are marginalized in relation to these factors. The methodology adapted will be focusing on a comparative approach. This paper will be focusing on the factors that influence social stratification of non-mainstream students in academia. Furthermore, this paper provides comparative examples that reflect the globalized social stratification obstacles in education.

Introduction

Curriculum should be established to create an educational environment for the goal of learning, consciousness, and knowledge construction. This study discusses the significance of multicultural education and its role to the construction of educators and students knowledge. Furthermore, it is imperative for multicultural education to be taught and supported in order to bring about more equity to schools, a sense of identity, and a sense of acceptance. Multicultural education according to (Gay, 2004) is defined as the following: "Multicultural education is much more than a few lessons about ethnically diverse individuals and events or a component that operates on the periphery of the education enterprise." Multicultural education paves the road to the culturally responsive classrooms. Nelson & Pang (2014) mention that the content of the history curriculum contradicts with the call of applying culturally responsive classrooms as current curriculum imposes non-culturally responsive classrooms. Through the examination of the schools history materials, one can simply notice the reflection of the militarization, patriotism, and the domination of the White- male and the marginalization of women, non Christians, and the invisible groups who were part and vital participants to the history (Nelson & Pang, 2014). In comparison, Nelson & Pang (2014) state that the recognition of both teachers and students to the multicultural social studies curriculum help and support teachers and students to define their own spaces in relation to history and other social fields. This in turn reflects how multicultural social studies curriculum paves the road to the more culturally responsive classrooms. The preparation and the adaptation of multicultural social studies curriculum pushes educators to understand the history and the concepts associated with the term multiculturalism. In fact, most of the time when scholars

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talk about the adaptation of multiculturalism in classrooms the first thing that will come to mind is related to folkloric dances, food, and the different cultural customs. While in reality, multicultural education refers to educators' capability to embrace students who are coming from different cultural backgrounds through granting them their agencies, making sure their voices are heard and educators should be knowledgeable and able to create a multicultural educational environment classrooms. Accordingly, and due to the confusion that is related to the multicultural education, it is significant to understand and comprehend the meaning of multiculturalism through the adaptation of culturally responsive classrooms that motivate students' consciousness. Students' consciousness can be empowered through critical thinking and critical pedagogies. Critical thinking urges students to be logical in receiving and evaluating arguments within a text. Furthermore, it enables students to question, judge, evaluate, and compare several social issues in a purpose of social change through 'act'. (Selwyn, 2014). Relatively, Sleeter and Grant (1996) affirm that knowledge is an essential tool and concept to power, consequently people cannot be powerful unless they have the knowledge that will motivate them to be powerful. Likewise, teachers can not teach students about power unless they have the knowledge that make them capable to teach about power. Scholars such as Freire, Banks, Dewey, and Giroux shed the light on the relation between pedagogy and power. Banks (1991) stressed the fact of empowering students through critical curriculum and multicultural education; this call of student empowerment through the critical education goes hand in hand with Orlowski (2014); Ross (2014); Selwyn (2014); Queen (2014); and Sleeter & Grant (1996). Those scholars support student empowerment through the existence of democratic and engaging curriculum. Thus, Sleeter & Grant (1996) present Ashcroft definition to power as "the capability of to act." (Grant & Sleeter, 1996). Furthermore, (Sleeter & Grant, 1996) mention that the educational power can be approached and can be transformed from theory to act through the existence of teachers who are knowledgeable and able to teach and design curriculum for empowerment. Building on that, Sleeter & Grant (1996) quoted (Greene 1985) a definition to teaching and power as: "an undertaking oriented to empowering persons to become different, to think critically and creatively, to peruse meanings, to make increasing sense of their actually lived worlds." (Sleeter and Grant,1996). Therefore, in order to empower students to reach the level of 'capability to act' they should have access to several empowering elements. The first empowering element is represented by consciousness (Selwyn, 2014). Atwater (2010) writes from her interview with Geneva Gay, that Gay asserts the old cliché, "knowledge is power." With that notion in mind Gay's outlook and goal is the redistributing of power through

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multicultural education, however she understand that access to knowledge and the control of it will not come easy, as power is always difficult to relinquish when it is controlled and manipulated already. More so, Sleeter (2001), is cognizant about the dire situation education is in. She documents that education in many communities where people of color, including poor Whites are in a state of emergency. The learning that is precipitated in the classroom is not a quality education and students are rapidly becoming disengaged from learning, leading to high dropout rates. The effect of the high dropout rates transfer to few Chicanos attending college. Multicultural education is a vital resource for people of color, especially for Chicanos that truly need to challenge the dominant culture, discourse and an oppressive status quo that fosters inequality and lack of opportunity for Chicanos. The goal of multicultural education according to Dixon, is a form of equity pedagogy that provides an opportunity for every child to attain an education. (Sonia Nieto 2010) emphasizes that multicultural education along with quality teaching and education is about renovations. Furthermore, (Chou, 2007) stresses that multicultural education will empower and bring about equity for the culturally diverse student population, the United States is currently comprised of. (Chou, 2007) states the following: "one of the highest priorities is to help prospective teachers acquire the attitudes, knowledge, skills, and dispositions to work effectively with culturally diverse students." It is imperative that teachers concede with an authentic and sincere demeanor toward cultural diverse students and that demeanor is promoted and advocated. Furthermore, it is essential to provide, foster, and sustain a democratic education with equity and equality in mind. Cherry and James Banks (1995) state that equity pedagogy implements strategies and fosters classroom settings that assist students from varied racial, ethnic, and cultural groups in attaining awareness, expertise, and a mind-set needed to function well within and help generate and perpetuate, a just, civilized, and autonomous society. It is important to recognize that historically education, especially social studies or history education has not been fairly represented. Classrooms are to provide an environment that encourages and supports the contributions to America's historical development from its diverse racial, ethnic, and cultural groups. The current strategy that only provides one historical perspective has created hegemony. It should not be a surprise that the White American point of view, and educational discourse created, implemented and sustained a superior ideology. Therefore, it should be the goal to provide a comprehensive education that promotes justice, equality and a more complete form of a democratic education. In the same vein, (Ross & Gibson, 2014) state that neoliberalism and privatization influenced the process of birthing culturally responsive classroom. Thus, instead of solving the issue of constructing culturally responsive classrooms, education in addition to

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economic sectors have been subjected to "market fundamentalism" (Ross & Gibson, 2007). Building on that, one of the critical issues that is related to the enhancement of the social studies is related to the space among teachers and students in relation to the 'pedagogy of the place' this concept might not be relevant to a certain culture or race, instead, it also refers to the cultural gap in schools and curriculum. Cashman (2013) states that border pedagogy might not be limited to the borderlines; however, borders can exist within means of thinking. Students' rights in regards to freethinking is confiscated in classrooms due to several factors such as but not limited to standardized tests. Students are lacking the ability of discussing certain social and international topics in social studies classrooms. This confiscation leads to the critical thinking isolation, lacking the critical discourses will disable students from becoming thinking-problem- solvers. Social Studies classrooms are about discussing social and international issues regardless of place and time. Students should be granted the tools that will support their critical thinking and they have to practice their agencies in classrooms as free thinkers but not as passive learners. Therefore, teaching students on how to react and analyze the social issues surrounding them will enhance their critical thinking abilities. Moreover, students should have space and access to various social issues as they should not be limited to a certain issue, topic, or culture. Correspondingly, students should have the freedom to express their opinions towards social issues. As a result, students will not be able to build their social knowledge without practicing their critical thinking tools. Finally, this study aimed to show the importance of multicultural education within the social stratification and how the lack of the culturally responsive classrooms, that resulted from the educators lack of diverse cultural knowledge affect the students' empowerment and affect students' knowledge.

Historical Background And Literature Review

Multicultural education represents one of the most controversial educational fields especially within the context of social studies and social justice (Evans, 2010).The importance and the value of the multicultural education has been questioned throughout history. Many individuals may ask and continue to ask about the value of multicultural education within the U.S. schools; such as: why this field has to be developed and supported. Simply, the field of multicultural education is very significant for two reasons:

1- The social structure and nature of the American society is very diverse. The United States society is very rich of different cultures. The U.S. society has many ethnicities, races, languages, and cultures as all of those give a unique structure to the U.S. society.

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2- The second reason behind the importance of supporting the multicultural education is related to the inequality that the individuals within this diverse society might face. These inequalities are exemplified by not having equal access to education, work etc.

The history of the multicultural education started in the United States back in the 1960s due to several oppressive acts to individuals for many factors that are not limited to the following: race, ethnicity, gender, sex orientation, and religion. The discrimination among individuals within the U.S. society negatively affected the economical, social, political, and the educational fields. Furthermore, these discriminatory roots played a role in creating classifications and labeling with in the U.S. society. As classifying individuals according to these labels created inequality, that led to marginalizing certain groups of individuals within the U.S society (Grant & Lei, 2001). Therefore, the multicultural movement sought a movement that aimed to change the social structure of the society in relation to power. The main purpose of the multicultural education is to enhance equality and equity within the society. Thus, multicultural movement from their advocate's perspective would enhance equal access to education that is away from any discriminatory acts (Grant & Lei, 2001). However, this movement as any movement that might face a lot of objections and refusal in the beginning. Multicultural movement faced resistance and critique from the most dominant social groups. Besides, this movement faced a conflict that was represented between groups of power, as their main goal was to keep their dominance through marginalizing the "other" groups and creating the "otherness" (Foner, 2002). However, this movement faced acceptance from the less powerful groups or the groups that struggle because of the social marginalization. According to the authors (Grant & Lei, 2001) the situation of conflict and resistance to the multicultural movement is strange in a country that calls for respecting the freedom and calls for equity. This type of rejection is problematic because multicultural education should gain acceptance, especially, and has been stated earlier that the main goal of multicultural education is to promote the efforts to provide equal education to students who are descending from different cultural backgrounds. It is significant to comprehend that multicultural education includes within its layers many concepts that are related to:

1- Understanding equity and equal education,
2- Understanding Diversity and difference.

These concepts include many different notions with their layers. Furthermore, these concepts are controversial, as these notions have been defined differently from one group to

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another (Grant & Lei 2001). The reason behind not reaching a determined definition is associated to the motives of the groups who are defining these concepts. In addition to that, it is very noticeable that the definitions of these concepts imply a lot of ideology. Therefore, it was hard to agree on a natural definition to the concepts associated with the multicultural education. Grant and Lei (2001) clarify that the paradox related to the concept of equity within the context of socio-historical in the U.S. as a tool to face dominant ideologies of the most dominant group and most privileged group (Grant & Lei 2001). Hence, the concepts of "equal and equality" represent a threatening act to the supremacy of groups who have power. In addition, highlighting these concepts will play a role in teaching oppressed people to call for their rights. Thus, limiting these types of movements will delay the people's awareness to their rights. Logically, lack of knowledge to the equal access of individuals within the society will help dominant groups to keep their dominance; dominance is related to power. Therefore, keeping the power for those groups over the less dominant groups. The factor of supremacy creates the social conflict within the social structure of the U.S. society. Adding to that, dominance of these groups penetrate to several institutions such as, but not limited to the educational institutions. These educational institutions include various social structures and individuals who are descending from different cultural backgrounds (Apple, 2013). Furthermore, within the stream of the concept of equity and equality both of Grant and Lei (2001) clarify that these concepts are the most generational concepts. In other words, these concepts and the definitions of these notions are changeable according to the strength of the most dominant group within a certain period of time. For instance, within each historical period there is a dominant group and there is an oppressed group. Additionally, inequality is being defined differently according to that period of time. Not to neglect the fact that the ideologies within a certain historical era might be different as well. The reason behind this difference is strongly related to the political factors, the power of decision makers, and the level of their dominance and power. For instance, the historical line of the United States shows the dominance of white males over any other group within the U.S. society. Adding to that, supremacy of this group was not limited to the social structure; however, it was over the educational system as education was limited to White males while colored people did not have the right to be education (Foner, 2002). This example reflects the inequality associated to the multicultural education and it shows how the movement of multicultural education during that time was problematic and not welcomed. History shows the superiority of whites was normalized, because the most dominant people during that time were whites and they were the policy makers. Therefore, the inequality associated to access of education was

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normalized in a sense that Whites were privileged and superior than any other social group that were considered inferior. All what has been stated is simply based on ideologies and these ideologies were influenced by the social, and the political factors (Grant & Lei, 2001). Therefore, and according to (Grant &Lei 2001) the theory of the stronger and the more powerful group has a visible role within history. It is very clear that the normalization of domination of a certain group represent a socio-historical and sociopolitical fact that penetrates the schooling system. For instance, powerful groups were policing who is teaching, who is learning, what are they teaching, and how do they teach it (Grant & Lei, 2001). Education in the 17th century was limited to white males and the teachers were white as well. Several races and ethnicities were excluded from schooling and from educational systems whether as learners, educators, and administrators. However, many individuals of different cultural and ethnic backgrounds such as the enslaved, free, and native people sacrificed their lives for the sake of their rights and their education. Moreover, numbers of immigrants increased in the U.S. and the gap between the ideology of dominance and the multicultural education increased as well. New concepts in addition equality and equity emerged. One of these concepts is the ‘ melting pot’ as a call for all cultures to be melted in the pot of ‘Americanization’ (Dewey, 1916; Dewey, 1938). Multicultural and ethnic studies advocates sought the ‘ melting pot’ concept as a tool of erasing the identities of many cultures. As a result, the multicultural movement started to face another type of resistance added to the goal of gaining equal rights; advocates started calling to protect the identities of groups who had been labeled as “minorities.”. The concept of sociocultural stratification is exemplified as an umbrella concept that includes all the tenets that are related to the society and the cultures within a certain society. Therefore, multicultural education is an important tool that plays a role in paving the road of equal education. Scholars such as Dewey, Sleeter, Nieto, Gay, McLaren, Banks, Au, and Apple, took the multicultural education as one of the focus elements to their work mainly stressed on issues of education, and the equal access to education. The demands of those scholars were united in relation to school policies and the factors associated to enhancing and preparing students towards a sociocultural equality (Au, 2009). The reason behind this preparation is to create the awareness environment so students, as citizens will call for and practice their rights. Sociocultural awareness will prepare students for cultural pluralism as well (Banks, 1973). However, the above goals were accompanied with different approaches in order to be implemented. Lei and Grant (2001) stated that James Banks (1973) in the introduction for the National Council for the Social Studies: Teaching Ethnic studies mentioned:

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This is not a book written by a group of irrational radicals who use these pages for counterproductive catharsis. Rather, it is book penned by distinguished group of scholars – social scientist and educators- who have spent the bulk of their lives fighting for human rights. Although they have experienced many frustrations in their perennial struggle – which their writing reflect- they have not despaired. They believe that the change is possible and that what teachers do in the classroom, or don't do can make a difference. This is probably the greatest significance of this book. It is bound to help every teacher who reads it to sense the urgent of their racial crisis in our nation, and to develop a commitment to act to resolve it.

James Banks (1973)

In addition and around the same time of Banks statement, the American Association of Colleges for Teachers Education's (AACTE) Commission on Multicultural Education issued: ''No One Model American'' as this statement represent the most quoted statement on ' Multicultural Education' :

Multicultural education is education, which values cultural pluralism…. Multicultural education reaches beyond awareness and understanding of cultural differences. More important than acceptance and support of these differences is the recognition of the right of these different cultures to exist. The goal of cultural pluralism can be achieved only if there is full recognition of cultural differences and an effective program that makes cultural equality real and meaningful. (p. 23)

The above statements show the tension associated with the multicultural education framings. The tension is related to the concepts of multicultural education such as the call for equity and equality. Furthermore, Bank's statement presents the fight of educators and the individual social scientists for equity and human rights in a goal of solving the issues of the "racial crisis". While the AACTE statement presents a demand on equality through the recognition of diverse cultures in the nation. In sum, this historical review shows and reflects the struggle of the multicultural movement and the shift among the concepts associated with multicultural education such as equality, equity, race, and gender. Adding to that, multiculturalism in relation to certain cultures is highly influence by the sociopolitical factor such as the situation of Arabs in the U.S. The political escalation plays a role in marginalizing them and targeting them according to the political crisis. This in turn, plays a negative role in affecting their access to school and affects the way that educators and media

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may represent them. Therefore, the call for the multicultural education should be enhances to prevent marginalization and isolation within the school system.

Mexico And Multiculturalism

The cultural, language and social domination, and marginalization of indigenous "minority" people can and have taken on many forms. One can argue that colonialism has led to discrimination, marginalization, and segregation. With the colonization of the Americas by both Spain and England, many indigenous languages were lost. Furthermore, these two countries also put an assault on indigenous cultures, customs and religion. Mexico began its attempt to decolonize on September 16, 1810 and after 11 years of conflict in 1821; Mexico won its independence from Spain. Unfortunately, its fight for independence left Mexico vulnerable to the colonial and imperial power of the newly developing United States. More so, indigenous nations were not able to decolonize from British imperialism. Consequently indigenous land, culture, language and religion were targeted and assaulted. Furthermore, Mexico was left in a very vulnerable position with their revolution against Spain. Martinez 1991 states the following: "Mexico's long war of independence from Spain left a new nation that was exhausted, weak and backward." With Manifest Destiny" as the their religious justification, the newly found United States marched on west to usurp more land, mute more languages and erase existing cultures. The United States had had its greedy eyes on Mexican lands for quite some time. With Mexico's refusal and declining to sell lands, America sought a way to justify a war with Mexico. Martinez 1991 mentions that the United States saw their opportunity to obtain more land for slavery, so they went after Mexico's land. With lies, deception and propaganda, the United States would justify their attack and assault on Mexico. Texas would be the first target, and then eventually the rest of the Southwest would follow. Utah, Nevada, Wyoming, Colorado, Arizona, California, and New Mexico were all taken by force. The Treaty of Guadalupe-Hidalgo (1846) gave the United States about one third of Mexico's land. This appropriation of land also left between 75,000 and 100,000 Mexican residence in the new United States acquired land. These people were promised the rights of citizenship, protections and privileges of the U.S. Constitution, yet this assurance would not hold true. The U.S. would add yet another piece of land in 1853, through the Gadsden Purchase, but this time, they did not use violence as they had on the previous two. The lack of citizenship rights continued into the 1900s. During the Great Depression (1930s) millions of Mexicans were deported from the United States (Gutierrez 2011). Prior to the Great Depression, a few Mexicans who had stayed in the United States through the Treaty of

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Guadalupe and the Gadsden Purchase began the first civil rights organization called the League of United Latin American Citizens (LULAC) in 1929. During World War II, many Mexicans and Americans of Mexican heritage volunteered and fought for the United States. WWII also brought a demand for cheap labor to the U.S. and the United States and Mexico "initiated an emergency war measure called the Bracero Program that would eventually last till the 1960s" (Gutierrez, 2011). It is estimated that well over 300,000 Mexicans or Americans of Mexican heritage fought for the U.S. Those who returned from the war created the American GI Forum (AGIF), in 1948. The AGIF became yet another organization meant to combat discrimination and segregation. It is imperative to look at the murky history between the United State and Mexico in order to understand the current issues and marginalization-taking place in our schools, educational institutions and curriculums. When looking at the relationship or lack of it between Mexico, and the United States, one must take note of America's imperialism, usurpation of Mexican land and the Treaty of Guadalupe Hidalgo (1848) which ended the colonization the seizing of Mexico's northwestern territories.

Multicultural Education In German Schools

There are many comparison points between the educational system at the primary and secondary level of Germany and the United States; both are controlled at the individual state level. Germany is a federal state, with sixteen different states, that each makes their own educational policies. The educational system of both countries can also be compared regarding the extend of the social stratification that can be found especially at the level of secondary education. Social stratification in this paper refers to the "reproduction of social inequalities in a society" (Lenze, 2011, p. 452). Germany is known as a country with a "highly stratified secondary education" (Lenze, 2011, p.464). Compared to the United States the "residential segregation is lower in Germany" (Baker, Esmer, Lenhardt & Meyer, 1985, p.218). However, while the desire to create isolation "between class and ethnic groups in the US", can be considered the main reasoning behind the residential segregation in the United States (Baker et al, 1985, p.224); in Germany the educational tracking takes care of creating distance between social classes, and isolates low status students by assigning them to the lowest track, or segregated special education schools (Förderschule). Germany is transitioning into being a country of immigration, currently there are about 16 million immigrants living in Germany (Foroutan, 2011, p.12). West Germany starting in the late 1950s had been seeking so called guest workers from Southern Europe and Turkey, because of the large demand of unskilled or semi-skilled manual laborers; however the guest workers were not expected to

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stay or bring their families to West Germany, the assumptions of this exclusionary model that the West German government represented at the time was that "the immigrants keep the domestic economy moving then go home; they make everyone richer without altering society and its status order" (Baker et al, 1985, p.215). The guest workers of the first generation were not included in the society or the educational system. Looking at enrollment data from 1979 shows, that in the 70s and 80s the West German government placed low status students in the lowest available track (Hauptschule), while 38 percent of all 13 year olds were enrolled in the basic track, "78 percent of all foreign 13 year olds were enrolled in the Hauptschule", and "well over 90 percent of the Turkish students the largest and most recent ethnic group were enrolled in the Hauptschule" (Baker et al, 1985, p.219). Tracking in the school system is a widely debated topic in the United States; in Germany tracking has a long tradition, as different economic needs required differently qualified students. However, today these demands don't exist in the same form anymore. International studies such as the OECD study PISA (Program for International Student Assessment) have repeatedly shown that children that have a non-dominant family background are doing less well in the educational system compared to children from the dominant culture in Germany. In Germany students are placed into a tiered educational system according to their perceived abilities. Future career opportunities are largely linked to the "track" a student is placed in, in this meritocratic sorting system (Lenze, 2011, p.452). Tracking refers to the "degree of institutional differentiation within a given educational level" (Lenze, 2011, p.452). While tracking is an overt characteristic of the German educational system, and it is considered a highly stratified country based on the number of tracks at the educational level (Lenze, 2011, p. 452), in the US tracking could be considered as taking place within a school settings as "curriculum tracking" (Marks, 2007, p.22). Germany has a "wider array of educational credentials than does the American system" (Kerckhoff, 2001, p.8). Kerckhoff emphasizes that the educational system in Germany functions as a "sorting machine" (Kerckhoff, 2001, p.3) "American trajectories are more influenced by students' choices, whereas the German trajectories are more influenced by forces within the German educational system that sorts students into increasingly diverse but restricted trajectories" (Kerckhoff, 2001, p. 13). And while tracking in the form of the German educational system cannot be found in the US, social selectivity is also inherent in the curriculum tracking and residential segregation that takes place. In Germany students have fewer choices they can make as they progress through the educational system (Kerckhoff, 2011, p.11). For both the United States as well as Germany it has been established that due to social selectivity based on socio-economic characteristics there is a

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bias towards "privileged groups" in the educational systems that perpetuates "socio-economic inequality" (Marks, 2007, p.23). According to Ross, Mathison & Vinson (2014) in the US „damage to children is reflected in higher rates of children leaving school for GED programs, increased dropout rates, increases in grade retention rates, and the creation of insurmountable hurdles of educational achievement for English language learners, special needs students, and generally those who are living in poverty"(p.40). Walter and Lechinsky (2007) discuss that the fact that "migrants" are under-served in the German education system cannot be questioned (Walter& Lechinsky, 2007, p.1). The authors in their attempt to explain this phenomenon default on emphasizing the "otherness" of the immigrant families, because the educational aspirations of families and their own insufficient education do not provide the parents with the skills to help their children to be successful in the German education system (Walter, Lechinsky, 2007, p.8). While it seems obvious that students have no agency in a tracked system, as it is not their choice where they will be placed, Walter and Lechinksy are creating "otherness" and are perpetuating preconceived notions about "migrants", this can clearly be seen in their language choice. They are arguing that parents do not have enough experience with the German educational system and they are also having expectations towards the school system that cannot be fulfilled, the way Walter and Lechinsky have worded this point in German is the following: "Diese Eltern übereignen der Schule oft weit mehr erzieherische Autorität und affektive Versorungsaufgaben, als die modern Schule erfüllen kann und zu erfüllen bereit ist." (**Those** parents assign more educational authority to the school and expect accommodations that the modern day school cannot provide.) An example for an over-generalized statement that serves to create otherness is this: "wenn Eltern selbst nur eine schulische Grundbildung genossen […]hatten"(if parents themselves **only** have a basic education), this statement is made to support the claim that "migrant" parents have a lack of understanding of the educational system. The language choice clearly serves the purpose of creating a distance between the mainstream and non-dominant groups.

Overall the educational system is tiered in Germany, all students attend elementary school until fourth grade and are separated in up to three different tracks, the lowest track is called "Hauptschule", and students graduate after 9th grade, before moving on to vocational schools. The middle track is called "Realschule", students graduate after 10th grade and can either move on to vocational schools or to the highest tier in order to gain their university entry-diploma (Abitur). The highest track in the system is called Gymnasium, and students graduate after 12th grade, or 13th grade in some states with exams that prove they are prepared to move on to education at the university level. So the Gymnasium is a college preparatory program.

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While parents do have a say in the placement decision, students who do not meet the academic requirements cannot be placed in the Gymnasium or have to be reassigned to a lower level after failing the strict "performance standards" at the highest level (Mostafa, 2009, p.8). In contrast to the United States Germany has a very strong apprenticeship system (Mostafa, 2009, p.8), while this system is the only opportunity for graduates from the Hauptschule and Realschule to access vocational training, the students are also competing with graduates from the Gymnasium over the best apprenticeships, this also perpetuates social inequality as students from the higher tracks are more likely to gain access to vocational training, if that is their desire. It can also be argued that the German system of "dual vocational education" serves to divert "lower-class students away from higher education and thereby cements social inequality" (Schneider& Tieben, 2011, p.140). Graduates from the highest educational track have access to all forms of education, university education as well as the vocational education, while graduates from the basic track, have to compete for a spot in the dual vocational education system (Schneider& Tieben, 2011, p. 140). Schneider and Tieben list the limited opportunities for graduates of the basic educational track, if they graduate with low grades from their programs chances to find entry into the "general upper secondary education is close to impossible, access to apprenticeship training or vocational school is possible, but difficult" (Schneider&Tieben, 2011, p.144). Due to the unfair competition over entry into vocational school the only alternative for graduates of the basic school (Hauptschule) is a transitional system until they reach the age of 18 to obtain the intermediate school leaving certificate to increase chances of gaining access to the apprenticeship system, if that is not successful they leave the educational system often times directly transitioning into the social welfare system. This is a problem that has been ongoing in Germany, as a study conducted in the late 80s by Palamidis and Schwarze examined the "effects of gender, age, family background and nationality on the transition to dual system apprenticeships", their finding show that "being female, younger and having a migrant background, a less educated or lower status father leads to lower chances of entering an apprenticeship" (Schneider& Tieben, 2011, p.147). Schneider and Tieben conclude that social inequalities in the German education system have not been decreasing, still today the differences as to who gains access to upper secondary education have not changed (Schneider & Tieben, 2011, p.160). For students coming from families with high social status the motivation is generally to "minimize the risk of downward mobility" so parents will make certain that their children get placed in the highest track (Schneider &Tieben, 2011, p.146). The rational the authors give for students from high status families being successful at the

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highest tracks is questionable, as they state that "children from higher status parents already have advantages in cognitive development and skills at the beginning of their educational career" (p.145) The authors claim that due to that their risk of failure in the higher tracks is lower for privileged children (Schneider & Tieben, 2011, p.145). This perspective seems to be similar for elementary level teachers making the placement recommendations as well, as students are placed according to the educational attainment of the parents as the above data shows. The system of the Gymnasium education in Germany that provides an elite with free university preparation is not highly criticized in the mainstream society as it benefits those with high status, after successfully completing this highest track students can gain access to university level education free of cost. While early education in Germany the so called "Kindergarten" is not free, parents have to pay for preschool education. It is another example of the social injustice in Germany, especially children with low status parents are the one's systematically under-served in the educational system, as parents might not have the means to pay for preschool education, their children start elementary school already at a disadvantage, because of the lack of support provided to them, while students with higher status parents are being rewarded with free university education which created an increasing gap in society. For the United States Oakes states that "poor and minority youngsters (principally black and Hispanic) are disproportionately placed in tracks for low-ability or non-college bound students" (Oakes, 1986, p. 14). The same has been true in Germany where a certain population is systematically denied access to higher education. In Germany, German is traditionally the language of instruction, and children are tested on their level of German before starting school, but being bilingual is not considered to be an asset while tested for the school readiness exam, so non-dominant students' mother tongue is not of value in the formal educational system, also the teachers are mostly from the dominant culture and have little knowledge about students' home life or culture, so the students lived daily realities are not represented in school, which leads to disengagement from formal schooling, low achievement, high drop-out rates and over-all low motivation. The lack of interest that teachers show towards students who do not share the mainstream societal background leads to the disconnection between students' home culture and the school culture (Walter& Lechinsky, 2007, p. 7). In Germany it is fairly common to blame the families for not providing an intellectually stimulating home, and for other reasons such as for not speaking German, among other accusations that are frequently used especially for the group of students of Turkish descent (Sarazzin, 2010). In his book *Deutschland schafft sich ab*, Sarazzin misrepresents immigrants of Turkish descent as largely uneducated and not receptive to

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higher education, his claims are not maintainable, because among all immigrants the group of Turkish descent made great progress in advancing in the tiered educational system when second and third generation are compared with the first generation immigrants. Unfortunately the fear of the Islam in Europe also fuels clichés and preconceived notions about Islam in Germany. While there is still a lot of institutional discrimination against this particular group they have been making progress. Data from the year 2008 show that 22,4 % of people of Turkish decent have a university entrance certification, while in the first generation 3% had a higher education (Foroutan, 2011, p.15). It cannot be claimed that immigrants have a disinterest in education; their positioning in the educational system is highly connected with political decisions regarding immigration. Another common misconception that is perpetuated in Germany's mainstream society is that immigrants do not care to learn German, the language of instruction in schools. Data from 2009 shows that 70% of people of Turkish decent in Germany have very good or good knowledge of the German language (Foroutan, 2011, p.16), so that claim is basically serving to underline the "otherness" of the second and third generation immigrants especially of Turkish descent.

The Study

This is a qualitative comparative study that highlights the differences between German and U.S. classrooms in relation to educators' cultural knowledge and in relation to the existence of culturally responsive classrooms. It examines the level of the culturally responsive classrooms that have diverse students who are descending from diverse cultural, national, and religious backgrounds. The case study method targeted one female born in Germany who is descending from a Turkish/ Muslim background, and a Mexican-American / Christian male who born in Texas. This study focused on the level of the culturally responsive classrooms and the level of student empowerment that are descending from diverse cultural background through multicultural education. Interviewing the participants represents the method adopted within this qualitative study.

Case Study Aisha

Aisha, (a name used to protect the participants identity), currently lives in the United States and has been born in Germany. Her family is Turkish and had been living in Germany as migrant workers. She spend the first three years of her life in Germany and moved back to Turkey with her family as a small child. Although born in Germany she has a Turkish citizenship. At the age of 15 her Dad suggested that the family moves back to Germany in

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order to give her the possibility to obtain German citizenship. The law at the time made it necessary that young adults who were born in Germany to families with different nationalities, make a decision about what citizenship they would like to obtain. Dual citizenship was not an option at the time. In order to allow for Aisha and her brother to gain German citizenship the children moved back to Germany with their father, the grandparents remained in Turkey, as well as the mother, the parents had been divorced. Aisha was placed in 9th grade, in Turkey she had been attending a school that emphasized the English language, but at home the family spoke Turkish only. The class she was placed into in Germany consisted of non-German speakers only, the classroom teacher used German and English only. Aisha explains that the teacher would do a good job at using prompts and pictures while she spoke in German and if students still did not understand what she said she translated into English, which for Aisha was not a problem, because she felt very comfortable with her English.

In conclusion one can say that although Aisha was promised to be placed into the highest educational track, after a "trial year" she was really placed into a segregated setting. Furthermore it can be questioned how students in this particular class would have learned German, if nobody in this class spoke German, and the teacher was the only native German speaker who used English. The dominance of English as a second language is also a disadvantage students who do not know either German or English. It can also be questioned how well a student is able to follow a class that is conducted in two unfamiliar languages.

Moreover, the classroom teacher did not use culturally responsive teaching strategies, as Aisha stated her culture was not addressed in the class.

Interviewer 1 : It was a public German High School?

Aisha: It was a public High School

Interviewer 1: So the materials it was all in German but you also had English classes?

Aisha: Yes, everything was in German but the teacher would translate to English

Interviewer 1: So the teachers were bilingual?

Aisha: Yes they were bilingual. We would communicate in English if they needed to send a note to my parents they would easily communicate to me in English.

Interviewer 1: Okay

Aisha: They didn't mind, they never said: No English, they were so encouraging there. You communicate somehow it doesn't matter in what language.

Interviewer 1: So they cared about the communication?...

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Aisha:…being bilingual is a problem in the US only, this is the only country that being bilingual is a problem, the other countries are so impressed…

Interviewer 1: …. Right

Aisha: they appreciate it

Interviewer 1: you are right

Interviewer 2: I'm interested you said High School, I'm wondering what it was called cause they have the …Gymnasium

Aisha: Gymasium

Interviewer 2: Okay because I wanted to clarify that because you can go different tracks, Gesamtschule, Mittelschule.

Aisha: Hold on Gesamtschule, I think they had us started with that is that the regular one? Is it one of the regular ones? That everybody can go to? Because I know that Gymnasium is a challenging one and they said you need to give it a try first for the first year and then move us to an upper track if we are doing good.

Interviewer 2: Mmh, did they put you in Gesamtschule?

Aisha: Now that you mentioned that yes.

Interviewer 2: So that is where all the kids were together? They were telling you they were going to give it a try?

Aisha: Next year if you do good yes

Interviewer 2: What did they base their decision on, was it…

Aisha: We didn't make it to the next year I just left the school…

Interviewer 2: oh. The Gesamtschule, I mean it is a while ago but do you remember was it a big class, what kind of kids were in your class?

Aisha: Ahm, I guess we were around 20 I remember those were all ESL students probably cause I remember an Italian girl she was younger than me she wouldn't speak English, too, she would teach me a few Italian words and we would try to communicate through English. I remember an Albanian teenage boy and I remember a Yugoslavian girl and some people from Poland those were all ESL students.

Interviewer 1: Ahh

Aisha: Everybody was foreigners not just me and my brother.

Interviewer 2: You think there were any native speakers of German in that class?

Aisha: No. And maybe that is because the teachers were bilingual. That would make sense

Interviewer 1: So you were in the ESL program?

Aisha: I guess so I wasn't told it (laughter) but now that I'm thinking about it.

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Interviewer 2: What would be ESL here would be the German as a second language class. So did they give you German classes?

Aisha: Everything was in German, only when I would struggle the teacher would keep going in German. The teacher would give a personal talk about my progress and if they would send a message to my parents if it was something rather than the class than they would talk to me in German.

Interviewer 2: So now you are talking about the language classes…

Aisha: …no all the classes I remember doing history, math everything was in German.

Interviewer 1: Everything was in German but you can ask in English?

Aisha: I didn't even need to. It is weird you get it from the context in many cases I didn't even rely on the translations.

Interviewer 1: But the teacher pay attention to the students? Did she think okay probably my students are not getting it, so let's try to explain it to them in English?

Aisha: Ahm she was a very I remember she …

Interviewer 1: was she bilingual too?

Aisha: It was one teacher for all the classes and she was very careful about her speech and she was very careful about her language and she would implement a lot of gestures, visuals she was amazing. You made me think of her, you would rarely need translations.

Interviewer 1: That is good instructors over there they are not…

Aisha: …she would use various intonations and anything that you can imagine in a language class.

Interviewer 1: But realizing that her students come from various backgrounds does she try to get you connected by talking about different cultures. You personally how you reflected…

Aisha: I never felt connected let me tell you that.

Interviewer 1: Why?

Aisha: Now that we are talking about the activities in class there was nothing that was geared to my culture. But I remember doing things about African culture there is a celebration of African culture Kweenze, Kwanza I remember mentioning that once I don't know maybe they were going to do it in the following months but I didn't make it but that was the only occasion that I remember. And I remember history classes she was talking a lot about Christianity and how Jesus was born…

Interviewer 1: …religion

Aisha: Religion. And now I'm thinking about it from time to time and I didn't really appreciate it. I don't know why do you need to emphasize religion?

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Interviewer 1: In a history class

Aisha: Yes it was in history

Interviewer 2: They have a particular they teach Christian religion in Religion classes.

Aisha: It might be a hidden curriculum that they implement (laughing) She was showing us a picture of Virgin Mary and those are pretty pictures, you would be impressed and be interested in it.

Interviewer 1: What about the religious background of the students? They were different?

Aisha: They were different yes

Interviewer 1: okay so she knows, well those students are coming from different religious backgrounds

Aisha: Yes there were Muslims, I'm sure the Italian girl was not Muslim, probably Christian. Yes that was a very diverse class in terms of religion and language background.

Interviewer 1: I'm going back to my question.

Aisha: I'm sorry

Interviewer 1: no, no I didn't frame it in a good way, let's say even in Math or in Science classes, right, for instance, even in the classes I teach as a research class I look at the I ask about the cultural background of my students the reason why is that I want them to get engaged and connected to the curriculum, now by doing that it is not necessary that I'm going to do an activity so how do you reflect on the teacher and the teaching methods of that teacher realizing that her students are coming from different cultural backgrounds? Was she trying to get you connected, while some of the students not understand something? Did she try to explain it to that student?

Aisha: I never remember, she was an excellent ESL teacher,

Interviewer 1: she is an ESL teacher?

Aisha: Well, she did everything else, she was a general teacher since she did everything with us.

In terms of ESL she was good. But as far as culture I don't remember anything else but the Christianity thing and the African celebration. She didn't put much on it. She knew our backgrounds at least she knew mine and my brothers. But it was all about their culture. I remember Halloween making ghosts and hanging them all over the place. But that month for Muslims that is the celebration of …

Interviewer 1: like Ramadan

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Aisha: yes it was Ramadan, cause I remember fasting but it wasn't mentioned in school. Even though she knew that we are Muslims, even though they have a big Turkish population in school in general it was never mentioned

This part of the interview also shows how Aisha was not aware of what kind of placement in the educational setting she had been in, during those months in 9th grade in Germany. The fact that one teacher taught all content classes is leading to the conclusion that it must have been a remedial setting for non-Native German speakers, all non-German speakers have been placed in one class. Furthermore the placement was not necessarily by age group, as Aisha's brother was older than her but they were classmates in this setting and Aisha described an Italian girl being younger than her, so it seems the criteria was the language not the age group of the particular students. Aisha and her brother had been told that after a trial year they could potentially be placed into a higher track, it can still be questioned on what grounds those decisions would have been made, as Aisha did not describe being tested to be placed into this class.

Aisha describes her time in the German school as positive, as a university student in the United States Aisha experienced discrimination based on her Muslim religion.

During the interview Aisha discussed her experience with one professor during her first semester in the United States:

Interviewer 1: How did he offend you?

Aisha: Ok, ahm, once I remember he was telling this stories about a Muslim woman that was all naked in her dream. And it was good enough to offend me. Why are you talking about a Muslim woman when I was sitting there, you are talking about a Muslim woman that is naked? That was one occasion that I remember I blushed really bad and then we were talking about Ottoman Empire he said I know your country you didn't start until the 19th hundreds, you guys did. And I said: Excuse me my country started in 16th hundreds, cuz it was a continuation of Ottoman Empire.

Interviewer 1: mmh

Aisha: And he goes: That is not the same thing, you guys barely started in 19th and you have a lot to go

Interviewer 1: He had his own history

Aisha: Yes, he was just trying to put me down in every opportunity that he had

Interviewer 1: mmh

Aisha: and he was mean in general, it was a tense environment, that was the only class that I felt that way I wasn't really learning I wasn't reflecting what I got cuz I didn't get anything,

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it was too much pressure that I was counting down the minutes. And now looking back he was racist

Interviewer 1: That is interesting that you are bringing this up because I wanted to ask you about culturally responsive classrooms here in the US. So when you were talking you already reflected on, now I want you to reflect on the reaction of the students. Did you feel, how did the students reacted to…

Aisha: …they were keeping quiet. It was not a matter of interest for them. And everybody was just quiet and I was just too ashamed to speak up because of my language cause that was my first semester, I was already all nervous about being in school in US that was too good to be real but then scary because everything was in English and I wasn't able to talk fluently and I wouldn't understand everything that I hear cause like I said in Turkey we don't have a chance to practice the language we learn the Grammar for years that is all about it. And he messed it up for me, he really messed it up I actually think about dropping the class I wasn't able to cause I was an international student, if you drop the class than you are out of status but I remember crying several times telling my husband that I don't want to go to school, I hate that man…

Interviewer 1: oh

Aisha: I'm not going to be able to make it to graduation and just because of him.

This example shows how one professor's intentional or unintentional cultural insensitivity in the classroom influences this student's motivation in the classroom.

Through her interactions with other students Aisha also noticed that she frequently got mistaken for some other Muslim lady wearing a Hijab.

Interviewer 1: Like the label that you got here. So you got labeled?

Aisha: Yes, you know what, for them we all look alike…

Interviewer 1: Yeah, they don't differentiate…

Aisha: All the Turkish ladies, cause I remember telling them are you Masa's wife? And I'm like: No. Are you Rajas wife? No. They would misplace me, misplace?

Interviewer 1: Because you are covered, so they have a misconception

Aisha: They only see the cover.

Interviewer 1: All Muslims are covered

Aisha: They only see the cover

Interviewer 1: yeah

Aisha: They don't ever pay attention to your face, if you are covered that should be you. I didn't feel bad about it.

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Interviewer 1: mmh

Aisha: I am different, I know it there was one student, he was gay he was trying to put me down he would say: You look like a cabbage! You are wearing a lot of layers. Don't you feel hot? And I remember…

Interviewer 2: Was it that same professor?

Aisha: Yes it was Dr. F. again. He would keep telling Are you cold? Are you cold? Cause I would keep my jacket on, cause with my huge belly I didn't want to show off that much. And they would keep saying are you cold? No. Are you cold? -No. That was one of the things that would get on my nerves.

Case Study 2

Raul is a male in his eighties and was born in Texas and considers himself a Mexican-American. For this case study an extensive interview process was conducted and artifacts presented by Raul were analyzed as well. Focusing on his educational experience he sadly described how he had to drop out of school in 7th grade in order to follow the crops and earn money to support his mother and siblings. Not having the opportunity to attend school for a longer time himself he dedicates much of his time to raising awareness of the importance of education, both in his own family and in his community. Furthermore Raul describes how Spanish was not allowed in school and he experienced corporal punishment for using Spanish, but learned fast not to use it in school and seemed to have been in support of the English only policy at his school because he liked the fact that he was able to learn English well. Considering the educational opportunities of migrant farm workers Raul stated that they were limited due to the fact that for the migrant worker families frequent relocation was typical as they would follow the crops and harvest season, in addition to that the small wages the workers received made it necessary for all family members to work even the work force of school-aged children was needed, which was the case for Raul and his siblings they all had to work in the fields. Analyzing one of the artifacts presented by Raul: "Gente que camina con las cosechas" (1979) showed that he had highlighted the following words and paragraphs that were particularly important to him and coincided with what he stated during the course of the interview. Social exploitation (p.2) of migrants (p.2) is one of the categories addressed in both the artifact and the interview. The topic of migrant worker children who are not attending school (p.2) was emotional to Raul, as he had always liked school and had wished that he would have had better opportunities to attend school for a longer time, instead the circumstances of being a member of a migrant worker family did not permit him to attend school after 7th grade. Considering education the artifact showed that: "in comparison to other

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of their classmates migrant children are generally 6 to 18 months behind" (p.18). Another important topic related to the social exploitation of the migrant workers is that of decent salaries (p.7). For example in 1977 migrant farm workers earned $17.70 per day, or $2,457 per year (p.12).Food stamps were also available but were expensive considering the migrants' wages. Total cost paid by immigrants for food in a year: $5,682.75 (p.12). Total of money paid by others, such as white migrant workers: $2,452.75(p.12). The life expectancy for migrant workers is 49 years (p.13). Summarizing the situation of migrant workers Raul pointed out that "They live like slaves in the past" (p.15). Some of the derogatory terms used for migrants are: *Alambristas:* the wired people because they had to cross the fence and *Mojados*: the wet ones, because they had to cross a river (Rio Grande). In the chapter *Los Campos sin fin* (p. 91-92) the topic of fair wages is touched upon.

"La ley de Normas de Trabajo Razonables" (Fair labor standards act) guaranteed a minimum wage per hour for most workers in industries but 30 years later after this Act was passed, the agricultural workers were specifically excluded from the benefits of this law (p.92). Constantly the migrant workers were told if they do not agree to work for the low wages some other workers will be found to replace them. For example: A family that worked a field earned 13 dollars an acre and were told by their employer that he had found illegal immigrants who could do the job for 11 dollars an hour, so this family felt forced to agree to work for an even lower wage (p.92). In the summer of 1977 the wages for workers picking out wheat root was sporadic, from $12 to $25 the supervisors would pay per acre to be picked out (harvested). Working on 1 acre usually took 10 hours to complete.

Currently (From the early 1930's until the book was published; late 1970's) the wage for harvesting 2 acres is 13 to 16 dollar which is less than $25 per acre approximately $2.50 per hour, one can clearly see from this fact how bad conditions had remained for over 40 years.

Findings

Acquiring the task of developing and constructing culturally responsive classrooms might be difficult without assuring the readiness of educators throughout the cross- cultural discourses and the developing of a cultural diversity knowledge base (Gay, 2001). Building on that Gay (2001) calls for culturally responsive curriculum, as he clarifies that ensuring having culturally responsive educators must ensure educators knowledge to content. Gay (2001) quotes Howard (1999): " We can't teach what we do not know" (p.106).

Relatively, Gay (2001) explains that Howard's statement reflects the importance of teachers' knowledge in relation to both students' diversity and to subject of content. Thus, both of Howard's statement, and Gay's reflection to Howard's statement presents the

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importance of Critical Multicultural Social Studies Curriculum (MSSC). Mistakenly, the discourse about social studies is immediately connected to the studies of the past and to the historical events that are related to the sanitized historical stories that aim to show patriotism in relation to people of power. Furthermore, Nelson and Pang (2014) state that the other misconception that is related to the social studies curriculum is simplified by the 'fact' presentation within the history and geography classes (Nelson & Pang, 2014).

The two case studies illustrate the struggles of migrant children in educational settings and the necessity to include the struggles of minority groups in the curriculum a field for that might be social studies classes. There is a lot to learn from the experiences of migrant children, their stories of how they encounter racism and institutional discrimination based on their religion or their social class can be an eye opener for educators to be more aware of their own covert or overt biases. Regarding the curriculum the two case studies show that the experiences such as that of Mexican-migrant workers, or that of migrant students with Muslim religion should be part of what students learn about in educational settings because it would raise awareness and sensitivity for different backgrounds and it would help to create a classroom environment that is appreciative of differences. Aisha's experience in particular shows how the overt racism of an educator can destroy motivation in a student to learn and to even create fear of attending classes. Raul's experience is an indicator that the experience of marginalized groups should be included in the current curriculum.

Conclusion

As a result, creating and designing culturally responsive curriculum and classrooms will help and enhance the educational achievements of students. Students will not suffer marginalization in the culturally responsive classrooms. Banks (1991) states that students need to be empowered as individuals and as students. This empowerment will not exist with the oppressive educational systems. According to Banks (1991) students need specific learning and academic environments to embrace them (p.125). Banks (1991) talks in chapter five "A Curriculum for Empowerment, Action, and Change: Empowerment through Multicultural Education" about the relation between learners (students) and the world. This concept is similar to Freire's' concepts in relation to the importance of education for the purpose of change "reading the word and the world." Additionally, Queen (2014) mentions that Freirian pedagogical tools insure and insist on learning for the purpose of freedom and face and fight oppression. Therefore, Banks and Freire concepts bond the relation between the oppressor and the oppressed, and the learner and the knowledge. As Banks (1991) affirms the empowerment through multicultural curriculum; Queen (2014) states that Freire affirms the

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necessity of approaching the social change through education. Education should help learners to realize how to be free and how to be active citizens. Queen (2014) inserts that Freirian pedagogy calls for the importance to understand that oppressors are humans and the social world that we live in is changeable. However, this change would not come true unless 'oppressed' people realize the relative fact between oppressed and oppressors as both of them are part of the society. The difference is that oppressors are more "powerful" than the oppressed. The classification of this power might be different as it might be political power, institutional power through individuals, might be economical power etc. but in the end and according to Freire, if people have the educational awareness and consciousness, they will be more able to understand the oppressive systems and the will be more capable of understanding that oppressors are humans that can be faced.

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Computer Games And Their Use In The Inquiry-Based Instruction

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Abstract
The inquiry-based instruction can be, based on results of many researches and investigations, considered as beneficial and perspective, regarding mainly the current social needs. It is at the most desirable to educate individuals who are creative, able to solve problems and discover unusual solutions. We react on the mentioned facts in this article by an implementation of modern technologies into a concept of the inquiry-based instruction. We work specifically on aspects bound to the computer games.

Key words: inquiry-based instruction, computer game, software, child, student.

Introduction

The article focuses on the problem solving connected to the concept of instruction called the inquiry-based instruction in relation to the information technology, respectively, to the computer games. We react on the education tendencies observable in international context and manifest themselves in application of not non-traditional concepts of instruction not only at level of basic schools. The main purpose of this approach is to emphasise the development and forming of the pupils' dispositions, i.a. cognition, thinking and imagination. The requirement of the pupil's development of competence to solve problems became important, as it is closely related to the inquiry-based instruction. These competences are often seen as unbound to the particular subjects, as the more general tendencies that are, however, applied in the concrete activities.

The significance of the competence development was also noticed by Lesh and Zawojewski (2007, p. 764). They state that *a highly developed problem solving skill facilitates a further education and a successful integration into the society, but it is also necessary for a lot of personal activities.* People have to often apply the knowledge, which they have learnt, in new situations and for that they need to control their basic thought and other general cognitive skills which create the essence of the individual competence for the problem solving.

In general, a game provides appropriate environment (platform) which provides the opportunity to develop the thinking and discovering of something new. This thought is proved by Čeláková and Čelák (1992, p. 9) who state that: *a game is older than the human, even our*

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animal ancestors were playing, perhaps, the life itself was created by a genial combinatory game. We actually do not know, how much knowledge, discoveries and skills have been created by a game and how much by an endless hard work. These thoughts lead us to focus our attention on this field because it seems to be perspective for the development and improvement of education.

Computer games and their application in education

A game is an activity of one or more people, which does not have to have a concrete purpose, however, it has an aim to create joy or to cause relaxation. Nevertheless, as Elmanová (1964) states, a game is not and should not be only a joy for a child – during a good game and with a good toy, the child is developing.

Computer games appeared with the development of computers and increasing of their availability to children, youth and adults. Therefore, there emerged a new dimension of a computer use. Computers were not used only as a working tool but as an instrument for fun and relaxation. In the beginning, these were only simple programs with bad graphics and they rarely contained a soundtrack.

A computer game is a specific kind of software that interacts with the user and serves mainly as a form of fun and relief, it can also often have a form of the educational software. The basic requirement for the realization of a game is necessity to have a computer station with a display device where will a given game be installed. It is normally obtained in two ways: either in an online way – downloaded from a digital storage, or from a digital carrier (DVD, Blu-ray) bought in shops. Furthermore, every game has a specific hardware requirements for the work station where a user wants to play the game. If the machine does not meet these requirements, it is not possible to use the given computer software (a game). The computer games can be played on the personal computers, laptops, mobile phones, tablets and game consoles.

Every computer game has its essence in the virtual world (also called virtual environment) which is entered by a player via the input components connected to the computer (either common ones – i.a. keyboard, mouse, or special ones – e.g. joypad, joystick, or a steering wheel) and via them, the player controls the world. The player's aim is to do their best when completing the tasks in the virtual environment, e.g. to go through a certain route as fast as possible, to hit as many objects as possible, to choose the most beautiful clothes, etc. (in this relation, we speak about so-called genres of games – strategy, simulator, arcade, RPG, adventure games, etc.).

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According to Šelong (2012), the computer games can be defined in two ways. In the narrow sence, we speak about computer games realized via personal computers and laptops mainly with the operation systems Windows, iOS, Linux and ChromeOS. In the broader sense, the computer games are all games that are mediated by the digital technologies (PC, laptops, mobile phones, digital recorders, game consoles). In this sense, we can call the computer games as *digital games*. In the following text, we will look at the computer games in the broader sense.

Vaculík (2002) sees the computer games as the basic part of the modern industrial society. Computer games function on the principle of overcoming the given (to every game individual) borders and the results comparison with the other players. The comparing of results often works at the level of professional scene, in other words *progaming*, where the teams with several members are created, and the individual teams compete with each other at the international or regional level.

The computer game may serve for fun, however, also for the knowledge development, sense development and thinking development. In some cases, the games are used even in medicine and psychology.

It is possible to cognize the unreal world via the virtual game world (sci-fi, fictional world, fantasy world) and real world (e.g. a child in a big city has limited options to get to know a forest and animals living there, however, they can run a computer game with this theme and therefore develop their knowledge). The computer games become a part of a tangible environment, which a child, during ontogenetic development of cognition, needs but which is not available to them. The excessive replacing of the real world by the virtual world though should not became a rule.

There is a plenty of games and plenty of toys that have been or are created. It may seem that with the development of the computer games, the classic games and their themes are fading. In many cases, it actually leads to a simple virtualization – games and toys moved from the real world to the virtual world (e.g. a child does not play football on the real pitch but on a virtual pitch which is simulated by a computer and the child only controls the players. The children no longer sit at the table and play Ludo in the real world, but simulated via a computer, etc.).

There is always a certain aim to be achieved when using software within the instruction. One of the main features of the game is the fact that game is an activity accompanied with joy and pleasure (however, in case of a defeat, the negative emotions can occur too). During a game, the individual plays just because they enjoys it; on the other hand, the case of school

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and work activities is different because their purpose is to achieve school and work aims and to fulfil the obligations. During the games (also the computer ones), we can achieved only the goals included in the game itself. Those, so-called *game goals*, can be reached by a certain difficulty, and how the individual reaches it, in what quantity and quality, becomes an object of a game.

The modern educational technologies that more often offer the elements that allow the application of the inquiry-based activities into the instruction.

It is appropriate to mention that the inquiry-based instruction is not bound to the environment where it is performed. It might be a common school classroom, a specialised school laboratory, but also recently more often used electronic educational environments, in some cases with elements of the virtual reality. The electronic support of the instruction is therefore not contrary to the inquiry-based instruction, they are not even in a conflict. Therefore we can speak about the possibilities of application of the computer games.

It would be beneficial to use the computer games to support the inquiry-based activities of children more, i.e. to stimulate their active thinking, asking questions and seeking for answers, the activity with subject matter itself, even of a manipulative character, if the situation requires that with respect to the competence development. The child is led to the realization of routine tasks that are sometimes monotonous and most of the time connected to the requirement about the speed of reactions, which is valued positively. It is shown that parents do not know the positive potential of the computer games which should not be rejected unequivocally.

For the purpose of this article, we look at the inquiry in the educational context as on a psychical and physical activity that manifest itself by activities focused on i.a. critical cognition of a studied facts, seeking of the truth, exploration and development of thinking base on one's own acting.

The computer games allow to bring the player (not only a child, but also an adult) into a conflict between their existing knowledge, skills, attitudes and acting, and the form of the virtual world or the needs that cannot be satisfied by the current cognition of the player, the level of their skills and readiness to solve the situation. The player is led and activated by the conflict to perform the inquiry, seeking of ways how to solve the given problem, how to obtain the new knowledge and bring one's own knowledge to balance with the virtual world created by a computer game. In order to let the player feel the conflict, there were created artificially caused (pre-programmed) situations. The player can be also led by their own inner

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motivation causing a sceptical look at the virtual world and stimuli that they perceives or comes with them into the interactions.

It is substantial to create conditions and based on them, to create the players' need to cognize and adapt the ways of action and thinking. The conditions that cause intellectual difficulties are based on the fact that the player cannot fulfil the task by already known ways (the difficulty, which they entered in the virtual world). In order to fulfil the task, they has to find a new way of solving the task. These situations causing the inevitable thought processes are called the *problem situations* in psychology, and the given tasks are called the *problem tasks* (cp. Maťuškin, 1973, p. 20).

There is also the thinking developed as well as the learning of the intellectual activities by the player who actively cognizes the virtual world created by a computer game. This definition of transferring the knowledge is in literature called "inquiry", "inquiry-based", "research", "heuristic", "discovery", "problem", see. e.g. A. Kluge (2011), J. Swaak, T. De Jong and R. Wouter van Joolingen (2004), and S. P. Lajoie et al. (2014).

Conclusions and recommendations

On the basis of the performed analysis, the requirements on the computer games applicable in the inquiry-based instruction are created. Those include:

- A virtual world has to be an environment full of stimuli that provide the conflict in the child´s mind.
- The computer game has to provide a feedback and a system of managing the inquiry-based activities of the child (pupil). This, however, does not mean hints and inadequate showing of the way how to solve the problems.
- The inquiry-based situations included in the virtual world of the computer game should not be distant to the real life.
- The computer game should not lead a child to such results of inquiry which are in conflict with the real world and should not contribute to forming of wrong ideas (misconcepts).

Based on the performed study, we are convinced that the inquiry-based computer games contribute positively to the development of thinking, imagination and knowledge of children.

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Computer-Based Vocabulary Learning:Comparison of the Feedbacks

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Abstract
Being a behaviorist aligned technique; drill and practice are still actively used in English vocabulary learning. The purpose of this study is to compare the effects of verification and elaborative feedback on students' English vocabulary learning. The pre-test post-test with control group experimental research design was used in the study. Freshman prospective teachers participated in the study. Findings indicate that utilizing elaborative feedback improves prospective teachers' vocabulary learning more than the verification feedback in computer-based vocabulary learning. Future research should investigate the effects of multimedia feedbacks on individuals' English vocabulary learning.

Keywords: Computer-based language learning; instructional technology; second language learning; feedbacks

Introduction

Rapid change process experienced in societies of our time makes it difficult for education systems to carry out an efficient and effective teaching with available resources of these systems (İmamoğlu, 2007). New technologies have been utilized in education because of the changes (Uyar, 2007; Salgut, 2007). With initiation of advanced technology usage in educational environments efficiently, another application, which has been brought to the problems of education systems as solutions, turns out to be computer assisted teaching (Çalışkan, 1999). Computers are indispensable units of teaching activities throughout the world (Underhill, 2006; Mason, 2001). According to Halis (2002), computer assisted teaching makes students participate in classes constantly because of its ability of acquiring the students with the chance of representing their performance related to the content taught.

Usage of computers in foreign language teaching and feedback activities are pervading swiftly nowadays, but it has been observed that usage of computers and feedback activities could not reach to intended level in spite of all efforts in foreign language teaching, and this takes place in agenda of our education system as an important problem (Bağçeci, 2004; Çelebi 2006; Gömleksiz, 1993; Tosun 2006). Under the light of these improvements, supporting ongoing English language teaching at schools via new technologies in education holds an important place in increasing knowledge and skills of learners (Uzunboylu, 2002). To get an insight of effectiveness of computers in foreign language teaching, more empirical study evidence needs to be obtained (Ateş, Altunay & Altun, 2006). In this sense, this study is

important to illustrate the importance of the effectiveness of using drill and practice in computer based English vocabulary learning exercises.

Feedbacks have distinct effects in learning of different contents and skills (Mory, 2004). Although there are research studies related to feedback use, it is not possible to reach to a common judgment about which type of feedback should be used in teaching different subjects (Huxham, 2007; Lyster & Ranta, 1997; Mason & Bruning, 2001; McNulty, 2007). Gilbert (2007) points out the importance of this issue, stating that an ideal feedback system has never been encountered when examining schools and occupations, and very few of directors, teachers, workers, and students have enough information on doing their jobs effectively. Moreover, Gilbert (2007) emphasizes that standard testing method in research studies conducted on learning theories and internal motivation is widely used in schools and other places. However, students do not receive rapid and effective feedback because of using feedbacks. There is a need for studies examining the effects of feedbacks on learning on computer-based learning (Güneş, 2007; McNulty, 2007; Öztürk, 2006; Scott, 2008; Wang & Wu, 2008). This study compared the effects of verification and elaborative feedback on students' English vocabulary learning.

Despite of the spread of computer assisted teaching environments nowadays, the question that how feedbacks should be used in student centered constructive learning environments has not been answered (Talboy, 2008). Computer assisted teaching with the aim of improving the achievement of students provides new feedback strategies using visual and audial stimulants (Çalışkan, 1999; Loewen and Erlam, 2006). The importance of computers in foreign language was noticed in 1990s and computers were used as a tool to provide students with individualized feedback and grammar explanations in foreign language teaching (Kern and Warschauer, 2000). Literature on feedback use (Bangert-Drowns et al., 1991; Mason & Bruning, 2001; McNulty, 2007; Talboy, 2008; Wang & Wu 2008) reveals that there are two major types of feedbacks used in computer based learning environment namely verification feedback and elaborative feedback.

In verification feedback, the information of whether an answer given by a student is correct or not is presented to the students and additional information is not provided (McNulty, 2007; Mory, 2004; Wang & Wu, 2008). According to Mason and Bruning (2001), researchers share the same understanding, that feedback is effective on the achievement of students; however, in order to improve the effects of feedbacks, it is important to explain learners why the response is correct or wrong.

Öztürk (2006) conducted a study to examine the effects of feedback type and timing of feedback activities on 6th grade students who receive education in computer assisted learning environment on students' achievement. In the study, it was observed that feedback in computer-assisted teaching was an effective variable on student learning. Additionally, it was found that the use of the different feedbacks is more effective than not using any type of feedback. In another research, Somuncu (1996) examined the effects of computer-assisted learning on 75 sophomore university students. Findings of the study indicated that as the amount of information used in feedbacks increases, the achievement of students increases.

Similarly, Ware and Warschauer (2006) conducted a study to determine the effect of traditional feedback in teaching environments and computer assisted feedback on English writing skills of students. The study aims at determining which kind of feedback provides students with correcting their mistakes automatically and improves their writing skills. At the end of the research, it was observed that using both feedbacks together has more advantages and English writing skills of students were much more effective at the end of the computer-assisted feedback. Tuzi (2001) investigated the effects of teacher/student feedbacks, which were given electronically on the processes of arrangement of written texts by the students who learn English as a second language. Research participants prepared their written texts in the internet and conveyed feedbacks to their friend again on the internet. Teachers and students participating in the study received guidance on the effective feedback and using technology at the beginning of the semester. At the end of the study, participants who received feedback indicated that they benefited from receiving feedback electronically.

Güneş (2007) investigated the effects of different feedback strategies and attitude towards internet usage in problem based learning in web environment on learning in terms of academic achievement of students. The study was conducted with 40 ninety-grade students in high schools. From the students grouped into two randomly, the students in the first group used verification feedback strategies and the other one used constructive feedback. Results of the study showed that there was not significant difference among academic achievement of the students to whom constructive feedback strategies were applied. Huang (1993) investigated the interactions between different kinds of feedback given by computers and low levels of readiness during teaching resting upon computer-based collaboration. Additionally, results of the study put it forward a significant difference between feedback types and former knowledge. Elaborative feedback was found to be more effective among students with high level of readiness.

McNulty (2007) investigated the effects of corrective feedback strategies on learning. Comprehensive observations were made in foreign language classes of four intermediate schools. In the study, McNulty (2007) puts fort not only that uttering by correcting was the most frequently used feedback type but also it is the least efficient type. He also claimed that the most successful feedback types were repetition, metalinguistic, elicitation and classification. In the study of Wang& Wu (2008), self-sufficiency, student feedback behavior, usage of learning strategies, performance and role of receiving feedback were investigated in internet based learning environment. 76 university students participated in the study. Qualitative and quantitative methods in data analysis in the study were used. Results of the study showed that students with high self-esteem used advanced learning strategies such as critical thinking. Furthermore, that self-esteem of students who received elaborative feedback increased and addition to this, feedbacks with information content raised the performances of the students was determined. However, results of the study displayed that feedback behaviors did not estimate academic performance.

Feedbacks provide information in different quantities and qualities according to its kinds. These feedbacks have distinct effects when it comes to learning different kinds of skills (Mory, 1992). According to McNulty (2007), the need of applying different feedback strategies in different circumstances is clear. Although, the subject of what kind of feedback strategy under what circumstances and to what extent has not gotten enough clearance yet. In this respect, research studies to be done about the effect of feedback on student achievement in terms of contribution to learning are important in terms of increasing quality of teaching and more correct and efficient usage of feedback.

The main purpose of this study is to compare the effects of verification and elaborative feedback on students' English vocabulary learning in computer-based learning environment. Following research questions were investigated in the study.

- How does the use of verification feedback affect the students' English vocabulary learning in computer-based learning environment?
- How does the use of elaborative feedback affect the students' English vocabulary learning in computer-based learning environment?
- Is there any difference between English vocabulary learning of students using verification feedback and those who use elaborative feedback in computer-based learning environment?

Method

In this study, the pre-test post-test with control group research design was used to compare the effects of verification and elaborative feedbacks on students' English vocabulary learning in the computer-based learning environment.

Participants

The study was conducted with 40 freshman prospective teachers who receive training in education faculty of a state university located in the Black Sea Region. The total of 40 students participated in the study voluntarily. While 20 students pursuing their education during the daytime were in the group using elaborative feedback, 20 students pursuing their education after 5pm were in the group utilizing verification feedback. The assignment of the groups was completed randomly.

Data Collection Instrument

The English vocabulary test was used for the data collection. The English vocabulary test was constructed for the study. The content validity of the instrument was ensured by receiving feedbacks from three experts. The internal consistency of the multiple-choice test was found as 0.89.

Experimental Conditions

An open source authoring application was used to develop the computer-based English vocabulary learning exercises. Besides attending the English courses that are compulsory for all freshman and that are taught by the same instructor, participants completed the computer-based English vocabulary learning exercises throughout the six weeks application of the study. Participants used the computer-based English vocabulary learning exercises two hours each week in the computer laboratory of the school of education. While the computer-based English vocabulary learning exercises with elaborative feedback were used in one group (Figure 1), the computer-based English vocabulary learning exercises with verification feedback were used in the other group (Figure 2).



Figure 1. Elaborative feedback example

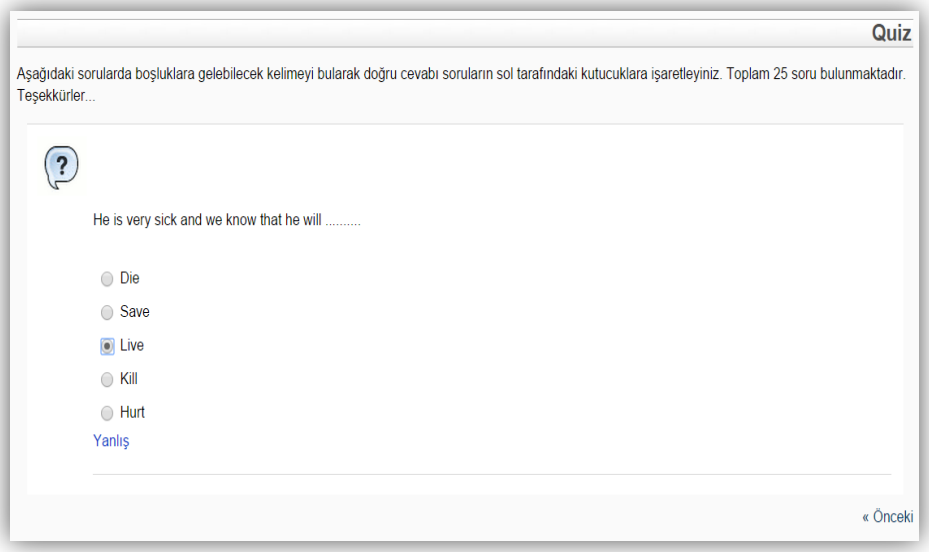


Figure 2. Verification feedback example

Data Analysis

Descriptive statistics, dependent t-test and independent samples t-tests were used for the data analysis using the Statistical Package for the Social Sciences. All the statistical analyses were conducted with a significant level of .05.

Findings

Statistically significant differences were not found when the pre-test results of the participants using the verification feedback and the pre-test results of the participants using the elaborative feedback were compared before the study ($t=0,67$, $p>0,05$). The first research question investigated the effects of using verification feedback on students' English

vocabulary learning in computer-based learning environment. The results of the dependent t-test revealed that the English vocabulary learning level of participants increased at the end of the study (t(19)= 11,59; p<.05) (Table 1).

Table 1. The pre-test and the post-test comparison of verification feedback group

Tests	N	$\overline{X}$	ss	sd	t	p
Pre-test	20	22,9	4,51	19	11,56	0,00
Post-test	20	52,3	11,79			

The second research question investigated the effects of using elaborative feedback on students' English vocabulary learning in computer-based learning environment. The results of the dependent t-test revealed that the English vocabulary learning level of participants increased at the end of the study (t(19)= 64.61; p<.05) (Table 2).

Table 2. The pre-test and the post-test comparison of elaborative feedback group

Tests	N	$\overline{X}$	ss	sd	t	p
Pre-test	20	21,60	7,27	19	64,61	0,00
Post-test	20	85,10	5,63			

The last research question investigated the difference between English vocabulary learning of students using verification feedback and those who use elaborative feedback in computer-based learning environment. The independent t-test results showed that the English vocabulary learning level of participants using elaborative feedback is higher than the English vocabulary learning level of participants utilizing verification feedback (t(38)= 11,22; p<.05) (Table 3).

Table 3. Comparison of the post-test results

Student Groups	N	$\overline{X}$	ss	sd	t	p
Elaborative Feedback	20	85,10	5,63	38	11,22	0,00
Verification Feedback	20	52,30	11,79			

Discussion And Conclusion

This study compared the effects of verification and elaborative feedback on students' English vocabulary learning in the computer-based learning environment. It was found that feedbacks used on computer-based learning affected the English vocabulary learning level of students in a positive way. It was also found that elaborative feedback used in the computer-based learning environment increased English vocabulary learning level of students more than verification feedback. The findings of the study showed that the use of either verification

feedback or elaborative feedback on the computer-based learning environment affected English vocabulary learning level of students positively. The results of the studies conducted by Öztürk (2006) with primary school students, Somuncuoğlu (1996) with university students and Ware & Warschauer (2006) on skills of writing in English support the findings of this study. When the studies related to the usage of feedback in computer-based learning environment and the study sample are taken into consideration, it is understood that the use of feedbacks affects the achievement of students in different age groups.

The comparison of the effectiveness of using verification and elaborative feedbacks on English vocabulary learning level of students was also investigated in the study. The results revealed that the use of elaboration feedback in computer-based learning environment increased the English vocabulary learning level of students more than the use of verification feedback. Somuncuoğlu (2006) claimed that feedback increased stableness in teaching and increased academic achievement as directly proportional with the amount of information which feedback provides. The amount of information in elaborative feedback is more than the information provided in verification feedback which supports the Somuncuoğlu (1996)'s assertion. Similarly, Wang & Wu (2008) stated that self-esteem of the students who took elaborative feedback rose and the informative feedbacks received for the correct answers increased students' performance. The results of this study indicate the need to design feedbacks that are comprehensive to improve the English vocabulary level of students. The comprehensive feedbacks that will be provided either to correct answers or to wrong answers will improve students' English vocabulary learning positively.

Concern towards foreign language learning is increasing day by day. With the aim of backing learning foreign language of students, different teaching materials which can work in computers and portable devices are being designed and improved for the purpose of supporting students' English vocabulary learning. The drill and practice exercises have an important role in foreign language learning. McNulty (2007) points to the need of using different feedback strategies in different circumstances.

This small-scale study conducted with the aim of shedding light on what kind of feedback to be used in designing drill and practice exercises for English vocabulary learning is important in terms of contributing to the studies available on the subject of feedback selection. Only the effects of written feedbacks are investigated in this study, the effects of feedbacks including multimedia components should be investigated in further studies.

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Constructing the Assessing Indicators of Evaluation Effectiveness through Fuzzy Delphi Technique for Vocational High Schools

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Abstract

The vocation school evaluation in Taiwan has been implementing for almost a decade. It is important to provide schools with the assessing indicators to establish their own self-check plans continuously and educational administrative units with references for policymaking. The purpose of this study aimed to construct the assessing indicators of evaluation effectiveness for vocational high schools. Literature review and focus group interview were employed to construct the 56-item Fuzzy Delphi technique questionnaire. The questionnaires were sent to 20 educational experts and scholars, such as professors, high school evaluation members, school administrative members, and teachers to ensure the assessing domains, subcategories, and indicators of the school evaluation effectiveness. Data collected from the questionnaires were analyzed by Fuzzy Delphi 1.0. The findings of the study suggest that the assessing indicators of evaluation effectiveness for vocational high schools consist of two domains, one is school management including subcategories of administrative effectiveness, resource integration, organizational interaction, and environment improvement; the other is professional development including subcategories of course planning, teacher profession, student performance, and top-notch talent cultivation and remedy for weak.

Keywords: assessing indicator, evaluation effectiveness, fuzzy Delphi Technique, school evaluation

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I. Introduction

1. School Evaluation is an important mechanism for improving school quality

Stukalina (2010) pointed out that educational environment and quality can be monitored through school evaluation system and students' performance can also be inspired and enhanced. Thus, a school's improvement can be assessed through criteria such as school

learning environment, students' feedback, students' participation in school affairs, students' learning satisfaction, and school staff members' interaction (Stukalina, 2010). As a result, school quality can be maintained or improved through school evaluation.

2. High school evaluation is the important project for the 12 year compulsory education in Taiwan

Tsai and Cheng (2008) mentioned that high school evaluation was included in the "12 year compulsory education" in 2007 to assist schools examine their own issues and conditions of school management for further improvement and development and quality assurance. Thus, every high school in Taiwan needs to participate in school evaluation to move from homogeneity to excellence, which has become the foundation of the implementation of the 12 year compulsory education.

3. Lack of studies on the development of the post evaluation of evaluated high schools

Many scholars tended to use meta-evaluation to assess the current schools evaluations. Yet, some issues were investigated through questionnaire survey or interviews, such as the appropriateness of the evaluated schools or the school improvement difficulties. Hall (2013) suggested that school evaluation process should vary depend upon various evaluation theories and methods. School evaluation should not just collect and analyze collected evaluation data. It should be the continuously interactive process between evaluators and evaluated units. Although the high school evaluation in Taiwan is rather effective but it cannot continuously investigate the evaluated schools' further progress and development of the post evaluation. Therefore, the assessing indicators of the post evaluation for high school evaluation should be established for schools to make self-check plans and sustainable development.

Ii. Literature Review

Many previous studies concerned only the effectiveness of school evaluation in western

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highly developed countries. In fact, school evaluation in some developing countries also produced a lot of evaluation of effectiveness. For instance, Bengal has improved its school management after the school evaluation was introduced. They also hope to further enhance the effectiveness of learning in the quality of teachers and students. In addition, Nepal's evaluation focused on school personnel and funds control and emphasized more on the school teachers' professional performance. DeGrauwe & Naidoo (2002) pointed out that Malaysia's schools actively seek to participate in school evaluation and their teachers possessed a high degree of willingness to be in accordance with the school schedule, and the school acceptance of evaluation was higher than other countries ◦ As a result, Evaluation can effectively promote the school progressed. Some studies reveal that evaluation has significant effect on teacher's professional and student's performance. Why is that? We assume that school evaluation implementation enforces school administrative officials to realize the importance of school management. School evaluation also brings appropriate pressure to inform the school leaders of the evaluation results was highly regarded by the national education authorities. In the competition, the school will be more actively seek better performance; school evaluation is to oversee the development of the school system, and thus the professional knowledge and ability and technical support can be obtained through school evaluation. In brief, prompting school progress through school evaluation is a global trend at present.

Torres and Preskill (2001) and Owen(2007) suggested that the effectiveness of educational evaluation refers to the functions and effects of the outcomes and the process of the educational evaluation to the evaluated subjects and organizations. Estyn (2011) stated that the issues or problems can be found through evaluation in order to effectively use the evaluation outcome. Then, school staff members should develop some strategies for improvement, and do follow-ups to ensure the fulfillment of the suggestions provided by

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the evaluation. Therefore, the reports of evaluations need to be used properly to make evaluations helpful. The report of evaluation is the beginning of improvement for next level, rather an ending. An evaluation with high effectiveness can have many functions, such as promoting organizational members' reflection, dialogue, sharing, attitude, motivation, decision-making, mobility, or authority of the important issues within organization. The evaluation system can be embedded in the school system to continuously provide schools with necessary information feedback and learning opportunities. Thus, the evaluation effectiveness can have impact on personals and groups, and further influence organizational learning and development.

To conclude, the results of above mentioned studies suggest that we can reasonably infer that the implementation process of evaluation can promote a dialogue with members of the organization and their in-depth thinking and reflection. In this process, the organizational and personal values, beliefs, assumptions, and knowledge can be clarified and confirmed (Foley, Klinge, & Reisner 2008; Preskill, 2005). Under the interaction the organizational structure, organizational culture, members' growth, and professional development of members are generated (as shown in Figure 1). These are the important benefits/effectiveness of evaluation implementation for schools.

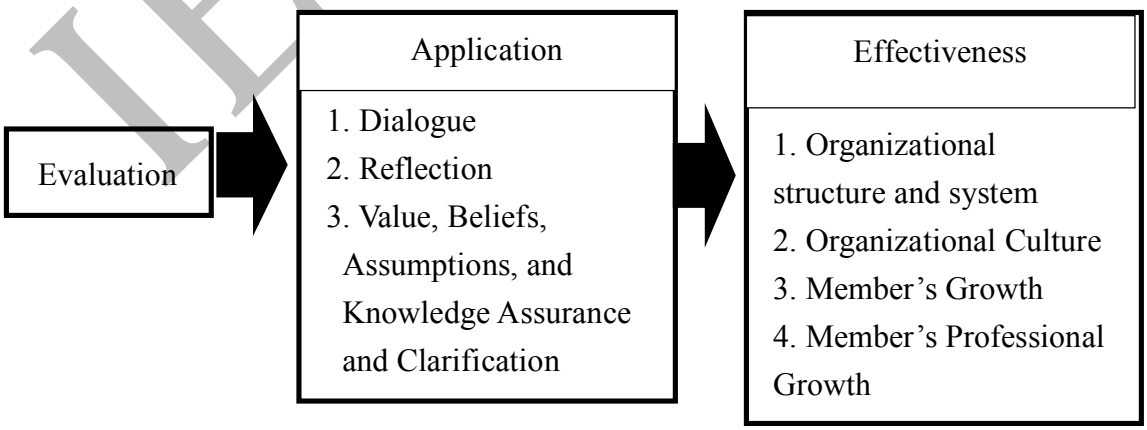


Figure 1. The Evaluation Effectiveness

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According to Fleischer (2007), evaluation can be beneficial to an organization based on the results of surveying on the US evaluation association members. Through evaluation, an organization can obtain the following benefits: 1. the organizational capability can be enhanced; 2. the organization can improve and fulfill the implementations of the strategic plans; 3. assisting those who are willing (intend) to use the results of evaluation to improve their basic concepts during practices; 4. increasing team learning motivation; and 5. strengthening those who are willing to use evaluation results to improve their thinking skills. Above mentioned benefits can be taken into considerations while constructing the indicators of vocational high school evaluation. Thus, the vocational high school evaluation effectiveness consists of two domains, including school management and professional development and eight subcategories (Amo & Cousins, 2004; Cousins et al., 2004; Owen, 2007; Reeve & Peerbhoy, 2007; Vanhoof & Petegem, 2012).

Table1. The Draft of Assessing Indicators of Evaluation Effectiveness for Vocational High Schools

Domain	Subcategory
School Management	administrative effectiveness, resource integration, organizational interaction, and environment improvement
Professional Development	course planning, teacher profession, student performance, and top-notch talent cultivation and remedy for weak

Iii. Research Method

In order to establish the assessing indicator system of vocational high school evaluation effectiveness, the researchers initially constructed 64 assessing indicators through reviewing the content of Taiwan vocational high school evaluation indicators, annual evaluation reports, and literature. After that, a total of 20 experts, including educators and scholars of educational administration, educational evaluation, and vocational education, and principals, directors, and staff members of vocational high schools were invited to join 2 times focus group interviews to obtain the draft of assessing indicators of evaluation effectiveness for vocational high schools.

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The results obtained from the two time focus group interviews were administered to the Fuzzy Delphi technique for further verification. Survey questionnaires were sent to a total of 20 experts in the related fields to obtained feedback, suggestions, and comments on the appropriateness of the assessing indicators of evaluation effectiveness for vocational high schools. The questionnaires collected from the 20 experts was first calculated the indicators of the triangular fuzzy values, L represents the minimum value of the expert consensus, M represents the geometric mean of possible values of the expert consensus, and U represents the maximum value of the expert consensus.

Iv. Results And Discussion

The triangular fuzzy number of the study was employed with the Fuzzy set defuzzify approach, using Fuzzy Delphi version 1.0 software package to calculate the l-values, r-values, and total values of the indicators. Screening GDP threshold setting of this study of the effectiveness of mining quartile calculations to Q1 as the threshold value of .600. Thus, the item values lower than .600 are removed. Table 2 shows the total values of the indicators for school management and professional development of the assessing indicators of evaluation effectiveness for vocational high schools. The following shows some indicators of the school management and professional development domains with values lower than the standard are deleted:

1. The school management domain

The following indicators with values lower than the standard value are deleted. They are 1-1-3 “School funding is effectively used”, 1-2-2 “The resources of various disciplines are effectively integrated”, 1-3-4 “Students and the school have better interaction mechanism.”, 1-4-4 “Environment improvement”, ◦ 1-4-4 “The school facilities and books should be enriched.”

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2. The professional development domain

2-2-2 “Teacher should adopt differentiated teaching according to students’ capabilities”, 2-2-3 “Teacher should adopt multiple assessment approaches”, 2-3-1 “Students overall behavior performances are progressed”, 2-3-2 “Student government organization can be more actively involved in the school of public affairs”, 2-3-3 “Student physical fitness can be more improved”, and 2-4-8 “Schools can more actively promote second language learning” are deleted due to the low total values. As a result, a total of 45 assessing indicators of school evaluation effectiveness for vocational high schools are kept after deleting 11 indicators from the original 56 indicators.

Table 2 The defuzzification values of the assessing indicators of evaluation effectiveness

Assessing Indicators	Right value	Left value	Synthesizing value	Delete or Not
I. School Management				
1-1 Administrative Effectiveness				
1-1-1 Help school understand the current situation and problems.	.770	.336	.717	
1-1-2 Can guide the school about administrative decision-making and the development direction.	.748	.374	.687	
1-1-3 School funding is effectively used.	.650	.499	.575	delete
1-1-4 The administrative satisfaction of school is enhanced.	.725	.389	.668	
1-1-5 School emphasizes more on performance management, continuous improvement through a feedback mechanism.	.737	.387	.675	
1-1-6 School can do school self-management, and enhance the educational performance through innovation.	.722	.419	.652	
1-1-7 Can help promote school reputation and public image.	.694	.430	.632	
1-2 Resource Integration				
1-2-1 The resources of all administrative units can be integrated.	.674	.466	.604	
1-2-2 The resources of various disciplines are effectively integrated.	.666	.480	.593	delete
1-2-3 School can actively seek external resources to improve school conditions.	.690	.449	.620	
1-2-4 School can utilize students’ parents or social connections.	.680	.435	.622	
1-2-5 School can establish various resource database.	.665	.462	.601	
1-2-6 Can actively integrate resource platform and establish the standardized process.	.708	.454	.627	
1-3 Organizational Interaction				
1-3-1 Can promote internal cooperation of administrative units.	.707	.429	.639	
1-3-2 Can promote teachers’ interactions.	.671	.463	.604	
1-3-3 Can promote the interactions between teachers and administrative units.	.680	.432	.624	
1-3-4 Students and the school have better interaction mechanism.	.644	.517	.564	delete
1-3-5 School has better interactions with outside/industry.	.678	.467	.606	
1-3-6 School staff can involve in more school affairs.	.705	.412	.647	
1-3-7 School staff can agree on school development plans and objectives.	.741	.363	.689	

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1-4 Environmental Improvement				
1-4-1 Campus can do more sustainable green landscaping work.	.693	.430	.631	
1-4-2 School experiment sites can be improved.	.704	.422	.641	
1-4-3 The management and safety can be more faultless.	.686	.421	.633	
1-4-4 The school facilities and books should be enriched.	.658	.474	.592	delete
1-4-5 The classrooms and teaching equipment can be effectively used.	.688	.460	.614	
1-4-6 School sports field, facilities, and equipment can be more complete.	.710	.406	.652	
1-4-7 School barrier-free facilities can be more complete.	.706	.421	.643	
1-4-8 School energy saving and reduce can be more effective.	.668	.444	.612	
Ii. Professional Development				
2-1 Course Planning				
2-1-1 School should strengthen the function of the curriculum development board.	.723	.404	.660	
2-1-2 School should adjust curriculum according to educational policies and social development.	.689	.424	.632	
2-1-3 School can offer more featured courses.	.717	.402	.657	
2-1-4 School can provide more career counseling courses.	.715	.401	.657	
2-1-5 School can provide students with more appropriate counseling for choosing elective course.	.696	.457	.620	
2-1-6 School can construct a platform for students to share curriculum information.	.724	.391	.667	
2-2 Teacher's Profession				
2-2-1 Teachers can develop the expertise and specialty.	.710	.402	.654	
2-2-2 Teachers should adopt differentiated teaching according to students' capabilities.	.650	.492	.579	delete
2-2-3 Teachers should adopt multiple assessment approaches.	.649	.493	.578	delete
2-2-4 Teachers can adjust their teaching strategies according to students' learning assessments.	.691	.431	.630	
2-2-5 Teachers can actively involve in teaching.	.725	.411	.657	
2-2-6 Teachers can do well on class management.	.708	.417	.646	
2-2-7 Teachers can actively participate in various seminars to improve professional knowledge.	.727	.408	.660	
2-2-8 Teachers can actively participate in social network groups to share their teaching experience with peers.	.718	.416	.651	
2-3 Students Performance				
2-3-1 Students overall behavior performances are progressed.	.633	.524	.555	delete
2-3-2 Student government organization can be more actively involved in the school of public affairs.	.646	.515	.565	delete
2-3-3 Student physical fitness can be more improved.	.638	.516	.561	delete
2-3-4 Students can actively participate in school club activities and performance.	.702	.434	.634	
2-3-5 Students can actively participate in on- and off-campus competitions.	.667	.462	.602	
2-3-6 Students can actively participate in outside visitations, exhibitions, and performances.	.651	.500	.576	delete
2-4 Top-Notch Talent Cultivation And Remedy For Weak				
2-4-1 School can more actively promote remedial teaching.	.710	.402	.654	
2-4-2 School can offer special students more intensive individualized instruction.	.712	.423	.645	
2-4-3 School can establish mechanisms for helping and caring disadvantaged students.	.742	.390	.676	
2-4-4 School can establish mechanisms for helping low achieved students.	.678	.451	.614	
2-4-5 School can set up more diversified scholarship programs.	.679	.449	.615	
2-4-6 School can actively promote special projects.	.705	.420	.643	
2-4-7 School can actively encourage academic exchange activities.	.679	.445	.617	
2-4-8 School can more actively promote second language learning.	.654	.461	.596	delete

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V. Conclusion

This study aimed to establish the assessing indicators of evaluation effectiveness for vocational high schools in Taiwan through document analysis and focus group interviews. The results of the study suggest that the assessing indicators can be categorized into 64 essential indicators including 2 domain (school management and professional development), and 8 subcategories (course planning, teacher profession, student performance, and top-notch talent cultivation and remedy for weak). The fuzzy Delphi technique was employed to refine the 64 indicators. The results are listed as follows.

1. The domains of the evaluation effectiveness for vocational high schools are school management and professional development. 2. The school management domain consists of 4 subcategories, including administrative effectiveness, resource integration, organizational interaction, and environment improvement; the professional development domain consists of course planning, teacher profession, student performance, and top-notch talent cultivation and remedy for weak.

3. The school management contains 24 indicators, and the professional development contains 21 indicators, which adds up 45 indicators in total (as shown in Table 2).

Vocational high schools and the administrative officials can adopt the 45 indicators developed by this study to assess the effectiveness of school evaluation. In addition, although the 45 indicators are reliable and effective through document analysis, focus group interview, and fuzzy Delphi technique, a large-scale questionnaire survey can be conducted to further verify the indicators and thus to assess the evaluation effectiveness after the evaluation.

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Ders Destek Aracı Olarak Kullanılan Video İçeriklerinin Lise Düzeyi Matematik Öğretiminde Başarıya Etkisi: Durum Analizi

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Özet
Gelişen teknoloji ile daha fazla yaygınlaşan bilgisayar ve internet kullanımı ile birlikte matematik öğreniminde elektronik çoklu ortam kaynaklarına kolayca ulaşılmaktadır. Artık bilginin tek kaynağı öğretmen değildir. Öğrenciler istenilen yer ve zamanda istenilen bilgiye kolayca erişebilmektedirler. Bu araştırmada öğrencilerin ders destek aracı olarak kullandıkları video içeriklerinin matematik başarısına etkisini araştırılmaktadır. Araştırma nicel araştırma olup, bir durum analizidir. Araştırma örneğini 2014-2015 eğitim öğretim yılında 1. Dönem Cibali Lisesinde bulunan 11. sınıf öğrencileri oluşturmaktadır. Veri toplama aracı olarak araştırmacı tarafından hazırlanacak anket formu ve 2014-2015 eğitim öğretim yılı 1. dönem matematik sınav puanları ortalaması kullanılacaktır. Öğrencilerin video içeriklerini kullanımı ile matematik başarısı arasında anlamlı bir farklılık çıkarsa, video içeriklerinin kullanım sıklığı ve zamanı ile matematik başarısı arasında da anlamlı bir farklılık olup olmadığına bakılacaktır.

Anahtar Kelimeler: Elektronik çoklu ortam kaynakları, ders destek aracı olarak kullanılan video içerikleri, matematik başarısı, durum analizi.

Giriş

Günümüzde bilgi yüklenmiş bireyler yetiştirmek yerine, bilimsel düşünen, olayları sorgulayan, özgür, yaratıcı, bilgi üreten ve özgüveni yüksek bireyler yetiştirmek gerekmektedir. Bunu yerine getirmek içinde bu görevi yerine getiren kurumlar kendini yenilemeli, dönüştürmeli ve bilgisayar destekli eğitimin farkına varmalıdır. Günümüzde birçok çocuğun elinde akıllı telefon bulunmakta ve istediği zaman istediği yerde bilgiye erişebilmektedir. Böyle imkânlara ulaşabilen bir nesli bilgiyi sadece öğreticiden elde edebileceği ve pasif olacağı ortamlarda tutmak zor olmaktadır. Geleneksel eğitim de ders esnasında dikkat çekici nesne kara tahta ve öğretmen iken gelişen teknolojiyle dikkat çeken öge öğrencilerin cep telefonudur. Öğrencinin dikkatinin çekebilmek için ise eğitim, değişen gelişen bilim ve teknolojiye ayak uydurmak zorundadır. (Numanoğlu, 1995). Bilgi ve iletişim teknolojilerindeki yeniliklerin eğitim sistemlerinin içerisine bütünleştirilmesi gerekmektedir. (Temelli & Genç, 2014) Numanoğlu ve Temelli&Genç in dediği gibi eğitim ortamları güncel kalabilmek için gelişen teknolojiyle dönüşmeli ve yenilenmelidir. Bu dönüşmeyi Türkiye de bulunan eğitim kurumları FATİH Projesiyle yapmaya çalışırken. Öğrenciler değişen yaşam koşullarına kendileri hızla ayak uydurmaktadır. Eğitim ortamları ister geleneksel olsun ister

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teknoloji ile bütünleştirilmiş olsun bireyler bilgiye kendileri istediği yer ve zamanda ulaşabilmektedir. Artık öğrenciler kendi öğrenmelerini yönlendirebilmektedir. Öğrencilerin zaten bilgisayarlara ve bilgisayar oyunlarına karşı hâlihazırda ilgileri mevcuttur. (Bakar A., Tüzen H., Çağıltay K.) Örneğin Karamustafaoğlu O., Bacanak A. ve Gençler S'nin yaptığı araştırmada öğrencilerin "VİTAMİN" hakkındaki düşünceleri alınmış ve öğrencilerin vitamin bir öğrenme ortamı olarak tercih ettikleri görülmüştür. Fen ve teknoloji dersi için yapılan bu araştırmada öğrencilerin bilgisayarı eğitim amaçlı da kullandıkları vurgulanmış. Bir diğer araştırmada ise bilgisayarların matematik dersindeki kullanım biçimlerini şöyle açıklamıştır.

- Alıştırma ve uygulama
- Eğitim temelli oyunlar
- Benzeşimler
- Özel öğretmen
- Problem çözme
- Materyal geliştirme
- Kayıt tutma (records management) (Heddens, J,W.; Speer, R.W. 1997 : Akt; ALOKOÇ Z. 2003)

Multimedia sistem sayesinde konular görsel ve işitsel olarak hazırlanmakta ve bilgisayar yardımı ile etkin eğitim sağlanmaktadır(Varol, 1997; Akt: Köşker E., Bahar H. 2012) Eğitim-öğretim ortamlarında bilimsel videoların kullanımı pedagojik bir araç olarak tanımlanmaktadır. Ayrıca, teori ile uygulamayı birleştirmede çok etkili bir araç olduğu düşünülmektedir (Hagen, 2002: Akt; Pekdağ B.2010). Bilişim teknolojilerin hızla artmasıyla gerek bireysel olarak matematik öğretmenleri, gerekse yayın şirketleri artık matematik anlatan dokümanları ücretsiz olarak internet ortamına yüklemektedir. Mevcut dokümanlar ağırlıklı olarak video kaydı olup bunlar sadece zamandan bağımsızlık sağlamaktadır. (Köşker E., Bahar H. 2012) www.şenolhoca.com, www.ekolhoca.com, körfez yayınları, eba, vitemin ve akademedia bunlara örnek verilebilir. Bu araştırmanın amacı da Cibali Lisesi'nden bulunan öğrencilerin ders destek aracı olarak kullandıkları video içeriklerinin matematik başarısına etkisini araştırılmaktadır.

Yöntem

Araştırma ortaöğretim öğrencilerinin ders destek aracı olarak kullandıkları video içeriklerinin matematik başarısına etkisini araştırılmaktadır. Araştırma nicel araştırma olup, bir durum analizidir.

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Evren Ve Örneklem

Araştırma evrenini 2014-2015 Eğitim Öğretim Yılında İstanbul da bulunan 11. sınıf öğrencileri oluşturmaktadır. Örneklemi ise Cibali Lisesinde bulunan 11. sınıf öğrencileri oluşturmaktadır. Toplam 46 öğrenciye ulaşılmıştır. Bunlardan 15 öğrenci kız öğrenci, 31 öğrenci ise erkek öğrencidir.

Veri Toplama Araçları

Öğrencilerin video içeriklerini kullanıp kullanmadıklarını öğrenmek için uzman görüşü alınarak hazırlanmış anket kullanılmış. Matematik başarılarını ölçmek için ise birinci ve 2. Matematik sınav ortalamaları kullanılmıştır. Başarı testi için deneyimli matematik öğretmenlerinden uzman görüşü alınmıştır.

Verilerin Analizi

Veriler SPSS programında değerlendirilmiştir. Video izleyen ve izlemeyen grupların akademik başarılarının arasında anlamlı bir farklılığın olup olmadığını görmek amacıyla; verimiz az denekli ve normallik varsayımını karşılamadığı için Mann Whitney U-Testi kullanılmıştır.

Video izleme sıklıkları ile matematik başarıları arasında anlamlı bir farklılık olup olmadığına bakmak için Kruskal Wallis H-Testi kullanılmıştır. Bağımsız değişken olan video izleme sıklığının alt grubu ikiden fazla olduğu için tercih edilmiştir.

Sonuç Ve Tartışma

Sıklık tablolarına bakıldığında araştırmaya katılan 22 öğrenci video izlerken, 24 öğrencinin video izlemediği görülmektedir.

videoiz

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	evet	22	47,8	47,8	47,8
	hayır	24	52,2	52,2	100,0
	Total	46	100,0	100,0	

Grup	**n**	**Sıra ortalaması**	**Sıra toplamı**	**U**	**.p**
Video izleyen	22	29,02	638,5	142,5	.008
Video izlemeyen	24	18,44	442,5		

Öncelikle Cibali Lisesi'nde bulunan öğrencilerin video içeriklerini kullanımı ile matematik dersinde ki akademik başarıları arasında anlamlı bir farklılık olup olmadığına bakılmıştır.

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p<.05 olduğu için öğrencilerin matematik dersi için video içeriklerini kullanmalarının matematik dersindeki akademik başarıya etkisi vardır denilebilir.

videoizlesıklık

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	hiç	24	52,2	52,2	52,2
	nadiren	9	19,6	19,6	71,7
	sık sık	13	28,3	28,3	100,0
	Total	46	100,0	100,0	

Matematik dersiyle ilgili video izleyen ve izlemeyenlerin sıklık tablosu yukarıdaki gibidir.

Kruskal-Wallis Test

Ranks

	videoizlesıklık	N	Mean Rank
basarıpuan	hiç	24	18,44
	nadiren	9	30,83
	sık sık	13	27,77
	Total	46	

Test Statistics[a,b]

	basarıpuan
Chi-Square	7,419
df	2
Asymp. Sig.	,024

a. Kruskal Wallis Test

b. Grouping Variable: videoizlesıklık

Video izleme sıklıkları ile matematik başarıları arasında anlamlı bir farklılık var mı diye baktığımızda ise p<.05 olduğu için anlamlı bir farklılık vardır. En yüksek ortalamaya nadiren video izleyenlerin sahip olduğu, en az ortalamaya ize hiç izlemeyenlerin sahip olduğu görülmektedir.

Grup	**n**	**Sıra ortalaması**	**Sıra toplamı**	**U**	**.p**
kız	15	29,90	445,50	136,500	.024
erkek	31	20,40	632,50		

Araştırmaya göre cinsiyetin akademik başarı üzerine anlamlı bir farklılığı vardır(p<.05).

Matematik dersi için kullanılan video içeriklerinin matematik dersindeki akademik başarıyı etkilediği görülmektedir. Video izleyen öğrenciler kendi tercihleri ile video izlemeyi seçmişlerdir. Bunu dikkate alırsak zaten matematik öğrenmeye karşı çaba harcayan öğrencilerin video izlediğini görülmektedir. Öğrencilere sorulduğunda video içeriklerini kullanmanın dersi pekiştirmeye, eksik kalan konuları tamamlamaya karşı etkili olduğu dile getirilmiştir.

Öğrencilerin izledikleri siteleri ağırlıklı olarak www.şenolhoca.com, www.ekolhoca.com, olarak belirtmişlerdir. Nadir olarak da vitamin ve teknofem kullanan vardır. Sitelere bakıldığında anlatılan videoyu anlamaları için belli bir matematik seviyesine sahip olmaları gerektiği görülmektedir. Konuyu daha temelden alan, basitten karmaşığa giden ve daha ilgi çekici video içerikleri olduğunda matematik öğrenmede güçlük çeken öğrencilere de ulaşılabilir.

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Design On The Muve: Synergizing Online Design Education With Multi-User Virtual Environments (Muve)

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Abstract
The world is becoming increasingly virtual. Since the invention of the World Wide Web, information and human interaction has been transferring to the web at a rapid rate. Education is one of the many institutions that is taking advantage of accessing large numbers of people globally through computers. While this can be a simpler task for disciplines focusing on lecture-based learning, it has been a challenge for the field of design. Transferring its studio-based education structure, where students draw, build, collaborate, test and iterate their work, requires using technologies outside of the common ones in information-based disciplines. This literature review analyses the current tools used in online design education and an alternative technology, called multi-user virtual environments (MUVE). Addressing MUVE's technological features, limitations and use in education, this paper proposes that a synergy between MUVE and online design education would be mutually beneficial.

Introduction

Designing is the act or process of creating some end result or artifact (Boradkar, 2010). It is a field that requires both creative thinking and critical problem solving (Boradkar, 2010) in complex situations while considering clients, goals, collaborators, aesthetics, logistics, safety, resources and feasibility of the project (Boradkar, 2010; Schön, 1983**)**. Today, the complexity in professional design projects requires collaboration of a team of individuals with diverse cultures, experiences, ideas, skills, knowledge and ways of thinking to maximize creative output (Badke-Schaub, 2010).

Design education must prepare the students for these complex settings and the design proficiencies they need in a professional setting (Broadfoot, 2003). Adapting and finding solutions within these complicated situations cannot be taught solely by lecture and requires practice (Waks, 2001). To handle such practically complex situations, traditional design education is characterized by its holistic approach for teaching students through a design studio approach (Broadfoot, 2003; Logan 2007; Schön, 1983; Waks 2001).

Studio-based learning, often practiced face-to-face, causes a challenge for teaching design online. Based on the extensive literature on design education, design studio proficiencies,

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online design education, and MUVE research, this paper highlights the benefits of possible synergy between online design education and MUVE as an educational environment. By becoming aware of MUVE's strengths and limitations, design instructors can use MUVE in their teaching to effectively prepare online students in practicing the necessary design proficiencies they need. Additionally, design instructors can enhance online learning by providing unique use and custom designs of the technology. Based on this literature review, this paper proposes that the synergy between online design education and MUVE can lead to a beneficial relationship between online learning and design education.

DESIGN STUDIO PROFICIENCIES

In design studios, students work within groups or individually to resolve a given design task supervised by their instructors (Broadfoot, 2003; Logan 2007). During the dynamic problem solving process (Broadfoot, 2003), students 'learn by doing' and 'reflection in action'. Students learn about the process and at the same time reflect on the process as it is executed (Broadfoot, 2003; Logan 2007; Schön, 1983). By doing so, design students work together to advance their collaboration proficiencies (Broadfoot, 2003), context proficiencies (Kvan, 2001; Schön, 1983), and iteration proficiencies (Gould, 1985). These proficiencies are soft skills, personality traits and behaviours that are professionally favourable (Schulz, 2008), the abilities students must foster to successfully compete in the market (Broadfoot, 2003). Exposure to design complexities and obtaining design soft skills are essential within a professional setting and can only be learned by actively doing and reflecting, they cannot be taught by lectures alone (Broadfoot, 2003). Below are the three aforementioned design studio soft skill categories students develop throughout their design studio work.

Collaboration Proficiencies: The complexity in professional design work requires the collaboration of many different people (Badke-Schaub, 2010). Simply placing people in teams does not mean they will work together effectively (Kvan, 2001; Schön, 1983). Aside from personality differences, the cultural and professional diversity within a group can lead to conflicting opinions, views and goals about the project (Badke-Schaub, 2010). To optimize team experience and output, it is important for design students to practice, understand and experience the dynamics and conflicts that take place in a team (Kvan, 2001). Only by doing so can students learn to mitigate the harmful conflicts and maximize the benefits of working in a diverse group (Haats, 2011).

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Context Proficiencies: Being a field about problem solving (Boradkar, 2010), designers must be aware of the context for which they are solving a problem (Gordon, 2011). This requires extensive knowledge, keen observation of the environment, and understanding of the people for whom their design will be useful (Greci, 2013). While designers can assess abundant information about users, the experience and understanding gained from interacting within the context generates a more effective output (Gordon, 2011; Kvan, 2001). To optimize understanding of the context, students must improve their observational, listening, empathetic and analytical skills (Greci, 2013). These are required for finding information about the context as well as identifying the most significant ones and applying such information to their design work (Kvan, 2001).

Iteration Proficiencies: Iteration is fundamental to good design (Gould, 1985; Mantei, 1988). Rarely do designers create the best result in their first try (Gould, 1985). Designers tend to reach the best solution possible and save costs when iteration is applied properly (Mantei, 1988). Through collaboration, context research and testing, a lot of information is gathered on what to do with one's design. However, not everyone knows what they want or how to articulate it, and not all feedback can be applied (Gould, 1985). Henry Ford says that if he "asked the people what they wanted, they would have said faster horses." This demonstrates the significance of a designer in identifying how to iterate their work throughout their collaborations, context understandings and prototype testing (Gould, 1985).

As the theme in design studios is to 'learn by doing' and 'reflection by action' (Broadfoot, 2003), the students must learn the iterative process by doing, reflecting and redoing (Gould, 1985). In design studios, with the guidance of their instructor, students learn through successes and mistakes to perform the iteration process correctly. Design students must realize the significance of designing for an audience, develop the proficiencies for empathizing and understanding their context, and practice iteration towards their learning in the design process (Kvan, 2001; Schön, 1983).

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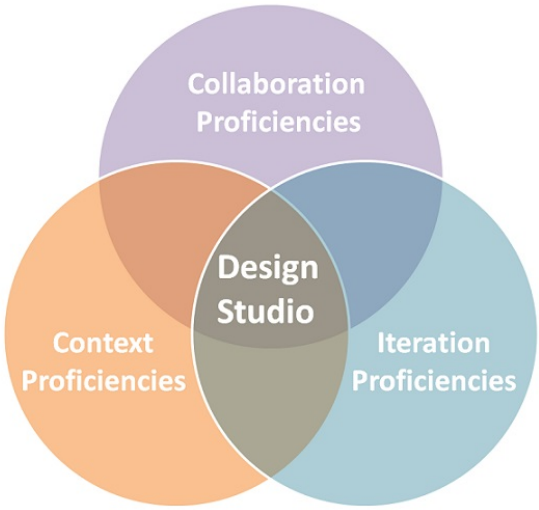


Figure 1. Illustration summarizing of the proficiencies students acquire in design studios.

As shown in Figure 1, while all these proficiencies vary, they all interact with one another and share a similarity in being practically acquired skills. However, since the audience for each design field is different (Buxton, 2010; Datta, 2007) the techniques and desirable outcomes from each type of design are also different. Design education must teach the students the requirements, techniques, expectations, and presentation skills in their design area (Buxton, 2010; Datta, 2007). As noted earlier, these design-specific skills cannot be taught merely by knowledge transfer and require an environment where the students can explore, repeat, and reflect to improve their work (Felder, 1988).

Practical proficiencies that cannot be taught via knowledge transfer require the student to explore, repeat, reflect and improve (Kvan, 2001; Schön, 1983). Doing so in the correct manner requires an educational environment in which they can practice these proficiencies, hone their skills with the guidance of an expert instructor, and be best prepared for the complex workforce.

Shift To Online Design Education

The invention of World Wide Web in 1992 made online education easily accessible around the globe, flexible in learning pace, and integrative with novel multimedia (Harasim, 2000). Since then, disciplines have aspired to teach online but faced challenges in adapting to the unique technologies (Park, 2008).

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Researchers have shown that active and engaging online education can promote creative thinking, problem solving (Broadfoot 2003; Waks 2001; Park, 2011), and enhance collaborative task-based productivity while overcoming the remote and financial restrictions of face-to-face learning for some students (Elliott, 2003; Liegel, 2004). Furthermore, learning in an online setting provides the students with the potential to work with experts and cultures anywhere in the world at any time (Brown, 2005; Vrasidas, 2003; Harasim, 2000) without exorbitant travel costs (Kvan, 2001). While journals may offer minimal understanding of other cultures, the real-time interaction with international students and teachers is substantially better (Kvan, 2001).

The cost effectiveness, convenience, and global accessibility are also very useful for design education. Given the benefits of collaborating with a diverse group (Badke-Schaub, 2010) online education can bring together people from all over the world for design students to practice working together (Harasim, 2000) without the high travel costs.

Given all these advantages, design is also shifting to online learning (Park, 2008). However, rather than utilizing the tools for new forms of communication, interaction and learning, many online educators commonly digitize their existing content, such as with educational videos (Barnes, 2007; Janet, 2009; Kirkup, 2005). This method is not effective for design education (Kvan, 2001). The studio-based nature of design education poses a unique challenge for its adaptation to online learning (Park, 2008). Regardless of all the benefits of online design learning, without satisfactory design studio features, design education cannot be conducted effectively in an online setting. As noted earlier, in an effective online design course, students' must practice their collaboration, context sensitivity, creative thinking, reflections, research, iterations, and problem solving soft skills within a studio-based setting (Broadfoot 2003; Waks 2001). Only by doing so can their online learning experience best prepare them for the complex nature of a professional design setting (Broadfoot, 2003; Park, 2008).

Online Design Studio Technology Options

To practice online design studios for learning the three design proficiencies, four technology categories are found in the literature. These four technology categories are

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computer-aided design (CAD) software, augmented reality devices, SMART boards, and MUVE platforms.

1. **Computer - Aided Design (CAD)** tools allow students to create 2-dimentional drawings or 3D models of their concepts while communicating only though voice, video, chat and screenshare features (Lau, 2013; Li, 2005). These programs, demonstrated in Figure 2, are easy to access, allow real-time collaboration and synchronous design iteration (Lau, 2013). CAD is a useful technology for design students to learn because most design corporations also use some type of CAD (Brown, 2005).

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2. 

Figure 2. Example of a collaborative CAD program, Fusion 360, which allows teams to jointly work on a cloud-based model together in real-time (Hayes, 2013).

Initially, CAD appears to be a sufficient tool for its digitalized lecture content and traditional communication tools, such as Webcams, forums, social networking and text chatting. In practice, CAD lacks student engagement (Cormier, 2009) and non-verbal communication (Nam, 2009), such as gaze and gestures, greatly affecting tele-collaboration (Vertegaal, 1999; Buxton, 1992; Ishii, 1998).Student engagement refers to the time and effort the student spends on their academic study and activity (Kuh, 2003). The engagement of the students positively relates to the depth and amount of information they learn, their problem solving and analysis abilities, and quality of output from their activities. Smith et al. (2009) state that key aspects of design education entail the participant's engagement and active participation. For effective collaboration and studio practice in online design learning, student engagement is essential (Park, 2011; Janet, 2009).

In online learning technologies, enabling student engagement relies primarily on the tools that maximize student's telepresence, or sense of connecting to others via technologies as if they are not remotely separated (Moldenhauer, 2010; Nam, 2009; Savin-Baden, 2010). Increasing a student's sense of telepresence in an online course increases their engagement, participation (Slater, 1986), sense of belonging in a community (Lau, 2013; Moldenhauer, 2010), interaction, learning, (Moldenhauer, 2010; Rowell, 2009; Savin-Baden, 2010; Slater,

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1986), contribution (Cormier, 2009), course performance (Hara, 2003; Rovai, 2005) and professional performance (Savin-Baden, 2010). Overall, maximizing engagement in online design education provides the students with the space to perform their best within the course and their professions.

As essential as telepresence and engagement is, much computer software, including instructional videos and CAD, used in online design education fails to maximize the student's telepresence (Cormier, 2009; Lau, 2013; Savin-Baden, 2010; Park, 2011).

2. Augmented reality devices are worn by users to give them a sense of existence to something that is not really in the physical world (Savin-Baden, 2010). For example, Nam and Sakong (2009) conducted and experiment using augmented reality devices to enhance collaborative object workspace at distance. By using virtual shadows and synch-turntables shown in Figure 3, design students were able to synchronously manipulate the object shown in Figure 3 (A) and be aware of their partner's actions and gestures. The results show an increased sense of working together in a shared space with their partner, comprehension of their partner's gestures and actions (Nam, 2009).

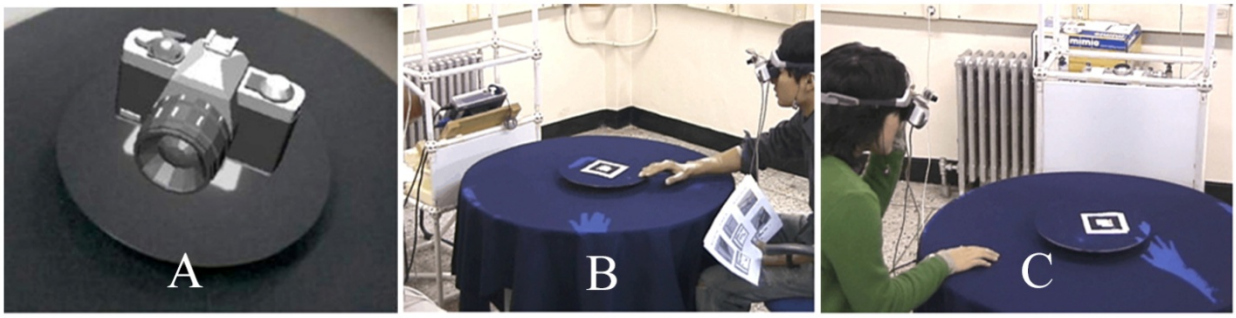


Figure 3. Images demonstrate (A) the virtual camera object the students can see with their augmented reality at the center of the turntable and (B) and (C) are simultaneous views from each participant showing the shadow of the other (Nam, 2009).

3. SMART boards are interactive whiteboards that can detect touch and gestures, that allow the space on top of the board to be shared with others who are also using SMART boards (Everitt, 2003). Researching on effective remote collaboration, Everitt et al. (2003) had six designers use SMART boards who were enthusiastic about the shared workspace and found the features to increase telepresence compared to whiteboard and videoconferencing. Figure 4 demonstrates the interactive feature of the SMART board where (A) and (B) images are from two different SMART boards used by geographically separated teams. (A) shows the

digital views of the post-it notes from the (B) board. (A) moves the electronic version of the "Cats" post-it note which appears simultaneously on board (B). Additionally, (C) demonstrates the shadow outline of the remote collaborator from the other board to increase tele-presence.

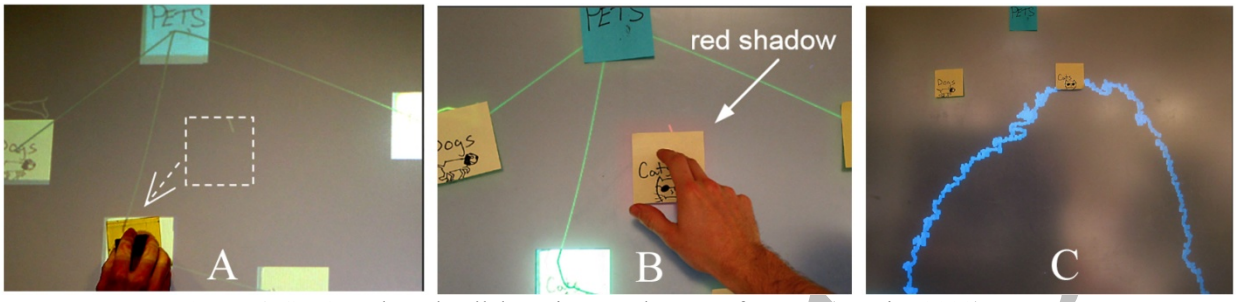


Figure 4. SMART board collaborative synchronous features (Everitt, 2003).

Both augmented reality devices and SMART boards tools are engaging and intuitive to apply in a design studio setting allowing students to visually express their designs and collaborate (Everitt, 2003; Nam, 2009; Savin-Baden, 2010). The primary challenge with using these in online design education is their high cost (Everitt, 2003). They are not affordable or accessible for the broad student population (Lau, 2013) and especially for the student population that prefers online learning because of its lower fees (Kvan, 2001). Since most higher education students interested in online learning own computers (Lau, 2013), online educators have turned to using online computer software for teaching design proficiencies (Kvan, 2001).

The tools mentioned in this section all lack an important part of conducting an online studio in design education (Janet, 2009; Park, 2008). The augmented reality and SMART technologies demonstrate that for design to take full advantage of the cost-effectiveness and global collaboration of online education, online tools used must be accessible to a broad range of students (Brown, 2005; Janet, 2009; Park, 2011). While CAD satisfies these requirements, it does not encourage student engagement (Cormier, 2009). Therefore, new online teaching methods must be adopted if design education seeks to use the benefits of online learning without the cost of sacrificing the necessary experience of design studios to the students (Kvan, 2001; Broadfoot 2003; Waks 2001; Park, 2008; Park, 2011; Harasim, 2000). As an alternative solution for online design learning to explore, this paper proposes the use of fourth option: multi-user virtual environments (MUVE).

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4. **Multi-User Virtual Environment (MUVE)** platforms are computer software that enable multiple users, represented by avatars, to navigate and collaborate in a 3D virtual world in real-time (Bessière, 2009; Warburton, 2009; White, 2010). Popular examples of MUVE software in education are Second Life, Immersive Terf, AvayaLive Engage and River City (Bessière, 2009). MUVE comes with a large variety of features within a single software application that collectively provide key features needed for online design education: easy accessibility, design visualization tools, communication tools, and student engagement.

The features of MUVE and the key requirements they meet are listed below:

1. Running on a cloud server and not requiring any additional tools (Greci, 2013), MUVE has broad accessibility for anyone with Internet access to join around the world at a low expense (Warburton, 2009).

2. Using a shared online virtual 3D space, MUVE enables multiple users to simultaneously participate and experience the same dynamic events at the same time. Improving the student's sense of presence and engagement within the environment, community and collaborative activity (Warburton, 2009).

3. 3D avatars that represent the user allow the participants to project their own identities into the virtual space (Meadows, 2008). This projection increases their sense of being within the environment and thus increasing the user's sense of presence and engagement in the space (Meadows, 2008; Slater 1986).

4. Audio communication, text chatting, webcam streaming, screen-sharing and avatar gestures allow for multisensory and versatile ways of communication between collaborators (Warburton, 2009).

5. The 3D world and avatars can be customized by the users, allowing both features to be presented as needed. This allows the students to not only make 3D models of objects as they do in CAD, but provides the ability to customize the appearance of the space and avatars to create a virtual context (Warburton, 2009). This custom created virtual context increases the sense of presence of students for a specific topic (Slater 1986).

6. Having real world similarities, such as topography, movement and physics, provides the illusion of being in a 'real' space and makes the interactions within the environment more intuitive for users while also improving their sense of presence (Warburton, 2009; Meadows, 2008).

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7. Using websites collaboratively within the MUVE platform provides access to many online collaborative drawing features (Warburton, 2009).

8. Video recording functions can be used by designers to reflect on their actions and better learn from their experience by remembering and watching their progress from a 3rd perspective (Meadows, 2008).

Combining all the aforementioned features into one package with advanced visual representations, MUVE is a popular and effective tool for collaborative simulations for people to effectively transfer their knowledge, skills and behaviours into the real world. Other fields have used MUVE in psychological therapy for phobias and trauma (Fullerton, 2004), changing dietary behaviours (Johnston, 2012), patient interaction in medical care (Greci, 2013), professional collaboration and critical thinking skill and behavioural development (Tichon, 2006) and process comprehension in the workplace, such as in mining, aviation, nursing, and pediatrics (Tichon, 2006). The following three studies demonstrate the potential for using MUVE for students to practice the three design studio proficiency categories: collaboration, context and iteration proficiencies.

Collaborative Proficiencies In Muve

Shrine Education Experience (SEE) was a project that involved students from all over the world in learning about archaeological findings within a custom designed MUVE, as shown in Figure 5 (Di Blas & Hazan, 2003; Di Blas & Paolini, 2003). This massive project had cooperative activities in which approximately 1400 students from Europe and Israel aged 12-19 worked together and played collaborative "cultural games" to learn about history, religion, anthropology and collaborate with one another (Di Blas & Hazan, 2003). The results of the studies showed a great majority of the students enjoyed learning and were motivated to participate, experienced how many different fields can converge to solve one issue, fascinated in interacting and collaborating with peers in distant countries with very different perspectives (Politis, 2008) and reflected on the significance of their learning relative to their own culture, everyday lives, and behaviours (Di Blas & Paolini, 2003). Throughout the study, students gained vital cross-cultural and interdisciplinary collaboration experiences (Di Blas & Paolini, 2003).

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Figure 5. The Virtual rendition of the Israel Museum's Shrine in the background with the students from around the world controlling their avatars (Di Blas & Hazan, 2003).

Context Proficiencies In Muve

To better understand and empathize local issues by engaging in Boston's Chinatown neighbourhood, Gordon and Schirra (2011) created a Participatory Chinatown environment in MUVE, shown in Figure 6, for urban planning students. The task for the students was to explore the virtual space, interact with the characters in the environment, discuss their observations with peers, and propose possible future designs for Chinatown. The study results show that the immersive, role-playing experience gave the students a strong sense of connection with the local community and a deeper understanding of their lifestyles and issues. Furthermore, the students who took the initiative to create discussion groups generated a deeper understanding of the context and provided more effective solutions for the town (Gordon, 2011).



Figure 6. (A) Participatory Chinatown modeled after Boston Chinatown where (B) a student playing as the avatar in the center.

Design Iteration In Muve

The OpenHabitat project was a 15 month study in which Art and Design university students engaged in collaborative design and experiential learning using MUVE (Warburton,

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2009). Their activities took advantage of an unlimited 3D canvas to build physically or financially impossible things in the real world, for example building 3D realistic and surrealistic trees as shown in Figure 7.

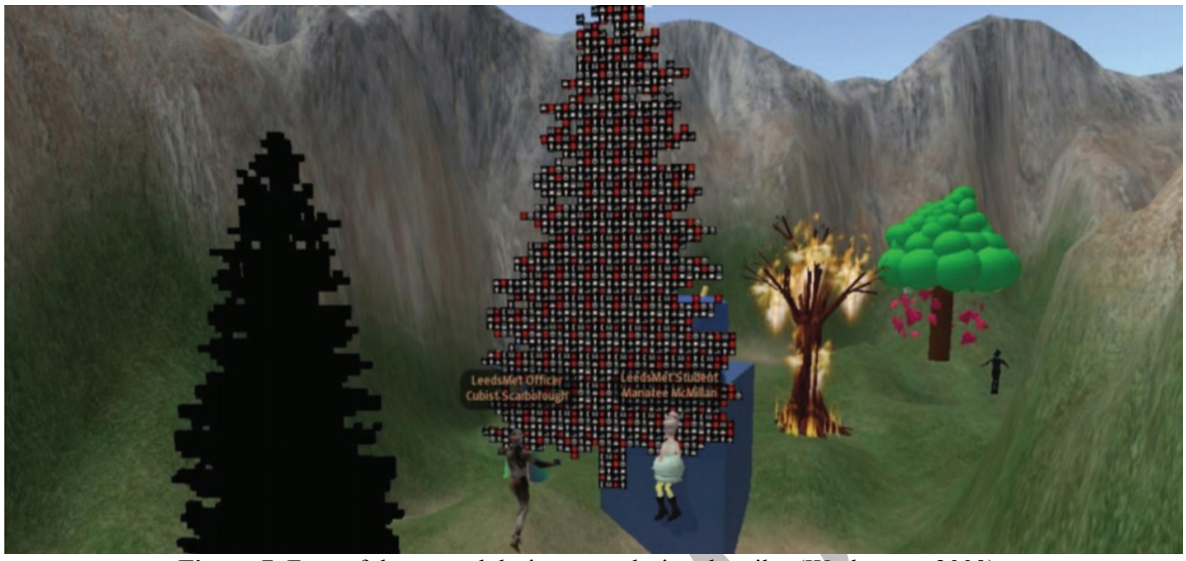


Figure 7. Four of the art and design trees during the pilot (Warburton, 2009).

After the initial orientations, students found the functions easy to use and were amazed at the boundless building capacity and the simplicity of the task, compared to real life. Having their models in a space where many can see them, made the students more attentive to their designs (White, 2010). The results of the study show that the students felt avatars represented the people well (Warburton, 2009), and had a strong sense of presence and belonging to a community (White, 2010). Their ability to work within a common space also encouraged working together through constructive dialogue, supporting one another's creative endeavour and the cross-pollination of design ideas. Although the study does not directly address design iterations, it addresses some of the key interactions for iteration: collaborative design, presenting work, observing other's designs, and giving and receiving constructive feedback (Gould, 1985). With the assistance of a design mentor, the students can learn to analyze these information and apply them to their work appropriately.

These three examples demonstrate the effective use of MUVE for developing design studio proficiencies. Fostering the strengths of these teaching methods in the design field could create an online design education environment for students to gain similar experiences, soft skills and preparation for the professional field.

Muve Limitations

To best utilize a technology, knowing its limitations is just as important as its strengths (Park, 2008). Prior to the implementation of MUVE within any course, it is essential to initially be aware of its limitations. Doing so sets the parameters and expectations that users should have when they design their courses, activities, and simulations (White, 2010).

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Most of the critics believe that even if online learning technologies improved significantly, it would still not be a learning system capable of substituting for face-to-face experiences (Ho, 2002; Park, 2008; Quinsee, 2004). For example, having limited gestures and facial expressions decreases effective non-verbal communication, empathy towards the avatars and engagement in the simulation (Arya, 2010; Volkova, 2011). Bucy (2003) notes that a bulk of research conducted on the efficacy of online courses only compare online learning to traditional course outcomes. This causes is a bias and neglects the inherent problems in face-to-face interactions that can disrupt effective collaboration (Vrasidas, 2003), which MUVE overcomes, such as balancing the status and power among the users (Greenhalgh, 1995; White, 2010) and removing judgment of people's true appearances (Vrasidas, 2003). Thus, it is important to understand the capability of the technology to avoid unrealistic expectations.

The second most common limitation is the learning curve for students using MUVE (Bessière, 2009; Warburton, 2009). While for some users the controls and functions in MUVE may come naturally, especially for those who play video games, it can be a challenge for others. Some students have mentioned that they found their initial experience overwhelming, with feelings of confusion and anxiety (Conrad, 2002, Rovai, 2005). As a consequence, students cannot concentrate on the task, lose quality communication, manage group conflicts, and perform effectively (Nowlan, 2011). It is essential for students to initially become familiar with using the technology and for educators to provide an initial tutorial phase within the course (Zembylas, 2008)

More pertinent to design is the lack of physical interaction with the objects (Bessière, 2009). Designers who will be creating the object in real life care substantially about the feel of the design and the ability to interact with the design. This is also an issue for instructors when judging and providing feedback to the students (Kvan, 2001). Another consequence is the misinterpretation of the virtual object compared to its real life form (Pickup, 2011). It has been proven that size of the avatar relative to the viewer's actual body can change the user's expectations about the objects in the environment.

A poor session in MUVE can make the participants feel their experience was less eventful and isolated than many other online social media, including forums and text chat. (Cormier 2009). Objects, simulations, content, teaching materials, and learning activities have to be

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customized when using the virtual world to merge the technology with the curriculum. Educators are encouraged to have a good understanding of the technology's capabilities and limitations before engaging in its use to avoid disappointment, miscommunication and student confusion between the expectations of the instructor and the student's resources within the technology (Vrasidas, 2003; Zembylas, 2008).

Discussion

By utilizing these tools, learning from past successful MUVE projects and becoming aware of the technological limitations in MUVE, educators can enhance online design education to become more engaging for the students. There are many areas of study to conduct when researching the benefits of using MUVE for enhancing design studio proficiencies. For collaboration, effective teamwork over distance opens the possibilities for students to experience cross-cultural design with partners located anywhere in the world. For context, simulations and role-playing can be large contributing factor to design education. Students can practice their sensitivity to the context of their future designs by being tasked to explore the space, communicate and empathize with the clients, and pick-up important cues that they can apply to their designs. For iteration, students can learn to iterate their designs together by giving each other feedbacks. Taking advantage of becoming avatars, face-to-face criticism can be avoided for students to be more comfortable providing each other with constructive feedback. Thus, students could learn to criticize, ask questions, take criticism, analyze people's feedbacks, and modify their designs appropriately with the guidance of an expert.

Furthermore, being an inherently creative, user-centered and hands-on field, design has the potential to bring a wide range of novelty to the ways that MUVE can be used. Design instructors are already proficient in and used to teaching innovation, user-friendly and intuitive designs (Broadfoot, 2003), creating unique active and collaborative projects (Waks, 2001). Designers who are also skilled at 3D modeling are capable of making the virtual world more user friendly, intuitive, and unique. Teachers who are creative in their studio teaching and class activities can create more imaginative projects to engage and educate students. Online design education projects have the potential to provide novel ways of using the technology that many other fields can take example from. Non-design fields not accustomed to these unique and active learning methods inherent in design studios could learn new teaching techniques and activities they can apply to their teachings on MUVE. The potential

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integration the research conducted on MUVE technology into design education could additionally benefit non-design fields in using the virtual world in unique and interactive ways. Therefore, synergy between design and MUVE technology and researching on effective use of virtual worlds in online design studios could assist the learning of online students all around the world.

Implementing these features in a curriculum requires teachers who have the willingness to become well versed with this novel technology and be creative in their teaching methods. This can be a challenge for many, but those who put in the effort can provide the opportunity for students who have financial or lifestyle limitations to participate in an active, innovative, engaging, multi-cultural, and interdisciplinary design experience.

Concusion

The growth of online education is imminent. Even practical fields, like design, are becoming taught at distance. The majority of the current technology used in online design education is not sufficient to provide effective studio experiences for design education. The functions within MUVE make it accessible, user-friendly, engaging, and collaborative, while providing designers with visualization tools to present their work. Using MUVE within their curriculum, design instructors have the potential to provide their students with the opportunity to develop their collaborative, context and iterative proficiencies. These soft skills are essential for design students to survive in a competitive, diverse and complex professional design environment. In addition to benefiting design students, non-design disciplines may also benefit from the innovative MUVE activities that design instructors developed. The synergy between online education with MUVE technology and design can lead to a mutually beneficial relationship and advance the world of education.

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Design Pedagogical Principles In Facebook As A Medium For Teaching And Learning

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Abstract
Personal and social roles played by key Facebook pupils in daily life has led scholars to put it as a home page for student learning. This study aims to develop design principles of pedagogy in Facebook as a medium of teaching and learning. In this study, the Fuzzy Delphi method is used. The approach used to collect research data is through questionnaires. The number of experts involved are 30 people consisting of Expert Teacher, Lecturer universities, Lecturer IPG and ICT experts involved with the education system. A pedagogical design principles in Facebook as a medium of teaching and learning has been developed. This study was conducted to provide guidelines that can be used by teachers for use in a planned manner to enhance the teaching and learning process through Facebook.

Introduction

Changes in information and communication technology has been a catalyst in teaching and learning methods. The concept of learning to use the Internet also is not new in Malaysia, but since 1997 the government has launched the Smart School concept in line with the Multimedia Super Corridor (MSC). Over the past decade, the Ministry of Education has spent more than RM6 billion for information and communication technology (ICT) in education initiatives such as Smart Schools (Ministry of Education, 2012). This is one of the most intensive capital investment ever made in the education system. However, the use of ICT in schools has not reached a satisfactory level, both in terms of quality or quantity. For example, the findings and results of the Ministry of Education study in 2010 found that approximately 80% of teachers use ICT less than one hour a week. Controversy is also increasingly serious when the study also shows that only one-third of students said that their teachers regularly use ICT (Ministry of Education, 2012). Furthermore according to a study conducted by the UNESCO in 2012, found that the use of ICT does not shift from mere use of the word processing application as a teaching tool (Ministry of Education, 2012). Although it is known that ICT has the potential to accelerate the process of learning science and thinking skills area but this potential has not been realized yet in the education system in Malaysia.

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Facebook is a social networking site based on ICT, the use of Facebook among students is very encouraging. This is backed and proven by the findings Mazman & Usluel (2010); Bicen & Cavus (2011); Ross, Orr, Sisic, Arseneault, Simmering, & Orr (2009); Cain (2008);, Golder, Wikinson, & Huberman (2007) who argue that Facebook is the popular social networking sites and has millions of users worldwide. For example, in the United States, the use of Facebook is so popular among the students with the participation of over 90% among undergraduate students as reported by several surveys (Ellison, Steinfield, & Lempe, 2007; Stutzman, 2006). It has also become one of the most popular social networks used by British students (Madge, Meek, Wellens, & Hooley, 2009) South African students (Shambare, Rugimbana, & Sithole, 2011) and student Slovenia (Slovenia Facebook Statistics , 2013). Malaysia also not miss in terms of the use of Facebook in which the data released by the total population of Malaysia internetworldstats.com display until February 2013 is to reach to 28.859154 million people, out of which, a total of 13.085000 million people are Facebook users . This clearly shows that the number of Facebook users in Malaysia is almost 50% of the total population of Malaysia.

In Malaysia, according to figures released by SocialBakers.com, students aged 18-24 years and 25-34 years age category were the two most used Facebook in Malaysia, 33.6% and 31%. The students, aged 13-17 years ranked third most populous age using Facebook in Malaysia, namely 14.1%. Up to the beginning of the year 2013, Malaysia was ranked 18th out of the total Facebook users worldwide. This clearly shows that Facebook is so popular among students. This popularity should be taken by educators opportunities to leverage Facebook as a tool that can contribute to the quality of education in Malaysia. This is because Facebook has the potential to benefit the students, especially in addressing low motivation (Mazman & Usluel, 2010).

There are three reasons that prompted the researcher to choose Facebook as a medium of teaching and learning first, Facebook is a social networking site popular (Ross et al, 2009), second, Facebook is a social networking site popular among students (Golder et al, 2007) and third, many studies say Facebook has the potential to be applied in the teaching and learning process. This clearly illustrates that there is a need to create use of Facebook as a tool integration ICT in teaching and learning process.

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If highlighted back on past studies have pointed out that the integration of ICT in pedagogy depends on the beliefs and attitudes of teachers towards technology (Ertmer, 2005), the knowledge they possess (Mishra & Koehler, 2006) and their ability to design and integrate knowledge pedagogy and technology (Chai, Koh & Tsai, 2011). This is evident when there is a consensus scholars concluded that the integration of technology into teaching and learning is highly dependent on trust, knowledge and expertise (Darling-Hammond, Bransford, Lepage, Hammerness & Duffy, 2005; Hong & Sullivan, 2009; Kramarski & Michalsky, 2010; Mishra, Koehler, & Kereluik, 2009). In short, teachers need to be equipped with the appropriate knowledge and skills so that they are able to adapt teaching and learning strategy based on the development of information technology. Arising out of the need for teachers to integrate the use of ICT, especially Facebook, clear that there is justification for the view that pedagogical principles using facebook to be applied to teachers in the implementation process of teaching and learning. The question is, what is the pedagogical principles that need to be known and to be completed within the teacher? And who is responsible for listing and preparing pedagogical principles of the teacher?

To answer the question that arises, then this study using fuzzy delphi method to see expert consensus on pedagogical principles that should be on the teacher. Use of the method appears to be very practical to get expert consensus (Mohd Ridhuan, Saedah, Zaharah, Nurulrabihah & Ahmad Arifin, 2014). This view is in line with (Bojadive & Bojadive, 2007; Saedah, 2008) which argues that the Fuzzy Delphi method is able to obtain data consistent and exhaustive because of the many experts and study a relatively short time compared to classic delphi technique that takes research quite long, can cause data loss and cause boredom to experts.

Therefore, this study aims to list out clear guidelines to teachers on pedagogical principles in Facebook as a medium of teaching and learning so as to serve as a guide for teachers to integrate facebook in teaching and learning based on the consensus of experts. This study is based on there is no longer used as a reference guide for teachers to develop a learning environment, especially the social networking site Facebook.

Relevant Literature

Polemic about Facebook is said to enhance interaction between teachers and students that make up the web-based communication has a lot to say. This corresponds with the findings of

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many research studies that discuss the use of Facebook that can contribute to increased academic achievement among users, especially students (Rosaffari & Shabariah, 2011; Blatter & Flory, 2009; Mason, 2006).

If look back, use facebook in the process of teaching and learning for students is a major factor why the teachers to make it as a medium that can help the implementation of teaching and learning. Mason (2006) pointed out that an effective educational technology through the use of Facebook actually be able to attract and stimulate the learning process between students and teachers, there are many features that you want and attract the use of reflective elements, peer feedback mechanism and is appropriate in the context of learning social. Facebook also able to have features that offer educational experiences that build while maintaining the privacy and security (Blatter & Fiori, 2009).

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Conceptual Framework

Conceptual framework developed in this study are based on the development of multimedia-based teaching media 3PTK (Rafiza & Maryam, 2013), which was modified by the researcher. This study was to investigate three domains emphasized in producing multimedia based educational media (Rafiza & Maryam, 2013). Domains are pedagogy, instructional design and process technology in teaching. Researchers have built a conceptual framework for this study as shown in Figure 1.1.

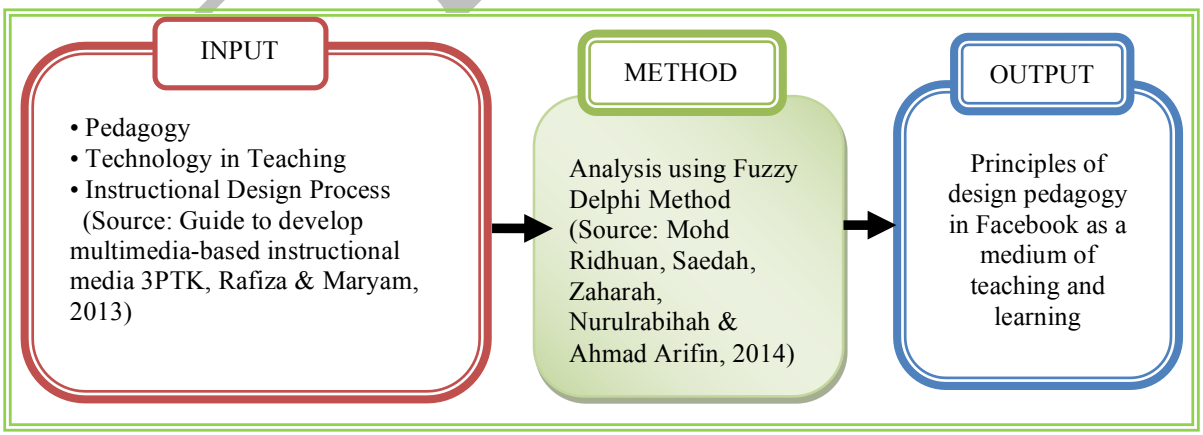


Figure 1 User developing multimedia-based instructional media 3PTK (Rafiza & Maryam, 2013: p 22)

Pedagogy

The teacher's role is to stimulate changes in the pupil. Teacher role in designing the learning experience, with the knowledge that the students control what he learned and learning is not a linear process (Allan, 2002). Successful online learning requires teachers to have the following characteristics: approachable, knowledgeable, can provide technical support, can interact with and motivate students (Allan, 2002). Kanuka & Anderson (1998) argued the need facilities to support the construction of knowledge in an online learning environment. This view corresponds with Diaz, Swan, Ice & Kupczynksi (2010) to assert online discussion that requires problem-solving skills that enable students to build knowledge and develop critical thinking skills when supported by appropriate teaching facilities. Later, in the use of Facebook as a medium of teaching and learning teachers must have the ability like help in identifying agreement and disagreement on the topics of learning can help students learn.

In addition, teachers should encourage students to debate and actively share opinions and be able to relate the contributions of students and knowledge as a woven (Salmon, 2005). Continuous support should be given to students in an environment of Facebook. Furthermore the Facebook environment as a medium of teaching and learning, the role of teachers must change. Master agreement also supports that the teacher is a consultant, guide and reference to the source, and design learning experiences to be shared with students (Goodyear, 2000; Salmon, 2005). So, a good teacher is believed to give motivation to the students so that they achieve a better standard tingg, able to manage and create a harmonious environment needed perlajar (Dewitt, Norlidah & Saedah, 2013).

Technology In Teaching

When it came up as a medium of teaching and learning, technology aspects are elements that need to be emphasized. It is based on the assertion Rafiza & Maryam (2013) on technological aspects in the development of multimedia-based teaching media stating that all respondents gave positive feedback, both in terms of knowledge about the field of technology, to the application of multimedia technology into instructional design. It proved as most respondents in the study Rafiza & Maryam (2013) argues that the use of technology and sophisticated multimedia material is capable of attracting students. This is in contrast to the findings of the state teachers are not prepared to use technology in teaching and learning

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problems caused teachers to integrate technology in teaching and learning (Varsidas & McIsaac, 2001; Voogt, Almekinders, Van Den Akker & Moohen, 2005 : Baek, Jong, & Kim, 2008). Zhao & Cziko (2001) and Buabeng-Andoh (2012) argue that the constraints faced by the teachers is the lack of proper training, lack of technical and administrative support, lack of institutional infrastructure, traditional pedagogical beliefs and attitudes to teachers who do not want change.

Both these different findings clearly show that teachers need support in terms of professional development and personal development to improve the use of technology in education among teachers. This opinion is strengthened by literature review of Plair (2008) revealed that teachers need an expert in technology to provide guidance to them how to integrate ICT in education. Thus the rationale for the existence of a framework of guidelines containing principles of pedagogy to teachers that can be used by them as a guideline in the use of technology in the educational aspects of learning, especially in Facebook that has potential as a medium of teaching and learning in secondary schools.

Framework guidelines on pedagogical principles should always be emphasized. The emphasis is not just state that it is important and in need of a positive attitude, but it should be realized in the development of learning materials on Facebook. Among the teachers need to be taught and trained well to improve their ICT skills to reap all the benefits of Facebook as a medium of teaching and learning. This statement is supported by the fact Levin & Wadmany (2008) which states in-service training for teachers to practice and ICT strategies to increase confidence, skills and knowledge of teachers and raising awareness in relation to changes in the classroom. Teachers also need to know how to use the multimedia resources of the Internet to deliver advanced teaching materials on Facebook once it is able to attract the interest of students in the learning process. However, the study results reveal that software is often used by teachers is Microsoft words (Mokhtar Nawawi, 2005). The majority of teachers surveyed are competent using Microsoft perisisian of the electronic word processing and presentation, but less skilled in using the Internet, databases or other online communication and networking. Therefore, to make Facebook as a medium of teaching and learning, teachers need to improve the technical skills to fully maximize the use of this social networking site.

In addition, the use of technology to support the educational objectives such as skills to find and evaluate information, collaboration, communication and problem solving skills

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which are very important for the training of students in the digital society (Drent & Mellissen, 2008). In addition, the services provided by Facebook can make students and teachers feel confident that the information and communication systems are safe, reliable, fit anywhere and impersonal. This is supported by Blattner & Fiori (2009) which stated Facebook has unique features that offer educational experiences that build while maintaining privacy and security.

Hew (2011) believe that the use of Facebook in learning and teaching is an alternative to integrating technology in education and provide opportunities for teachers to apply different pedagogical work for the benefit of students. Facebook applications have the potential to optimize the effectiveness of the teaching process (Bugeja, 2006; Rossafri & Shabariah, 2011). Teachers' ability to apply the technology in Facebook are likely to provide a positive impact in making the learning process more meaningful and effective.

Instructional Design Process

> *" Designing instruction is the prosess of translating principles of learning and instruction into plans for instructional materials and activities."*
>
> (Smith & Ragan, 1999, pg. 2)

The Dick & Reiser (1989) defines instructional design as a systematic process for designing, developing, implementing and evaluating teaching. Selection of instructional media have a great relationship in the process of planning a topic or activity to determine the effectiveness of teaching (Ismail Zain, 2002). Dick & Reiser (1989) explains this concept and propose a model of instructional design.

A teacher should be aware of aspects of instructional design because without a comprehensive and systematic planning, a teacher can not achieve effectiveness in teaching, particularly in the selection and application of instructional media. Unfortunately, the results of a study conducted by Rafiza & Maryam (2013) found that almost all respondents were found not using the design model in the development of multimedia-based teaching media. This is seen by them as an understanding of the low in terms of instructional design model leads to a failure to apply these aspects in the development of multimedia-based teaching media.

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Instructional design is heavily influenced by developments in learning theory because these two areas are closely interconnected with each other (Dick, Carey, & Carey, 2001). According to Thomson (2001), theories and models of teaching will guide teachers in accelerating the process of developing materials to assist in communication with team members and designers covering all phases of instructional design (Rio, 2007). Many theories and instructional design model depends on several steps in the production of effective learning (Park & Hanaffin, 1993) This model consists of three main phases namely 'Need Assessment Phase "(Phase Analysis of needs),' Design Phase '(The design phase) and 'Develop & Implement phase' (development and implementation). In addition, each phase will be through a process of evaluation and revision of an ongoing process.

The importance of using model-based learning design in Facebook reinforced by a study conducted by Norlidah, Saedah, Mohd and Zaharah (2013), In these studies they have reviewed the effectiveness of Facebook to enhance creativity among students of Islamic Studies using instructional design model Isman. The results show that models of teaching Isman pay attention to the direction of the content is appropriate perspective in designing and developing a Facebook-based learning to enhance creativity among students of Islamic studies at secondary schools in Malaysia.

Based on the interest that has been stated above, the waiver on aspects of instructional design model in Facebook as a medium of teaching and learning will lead to outcomes not achieve the desired objectives and lead the process of teaching and learning can not be run smoothly. Instructional design application in Facebook is essential for the improvement of education quality and diversity of the learning process.

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Methodology

Expert questionnaire is a useful tool for data collection in Delphi method when interviewing individuals can not be done due to time constraints and group composition (Dalkey, 1969). Questions expert questionnaire was published on the recommendations relating to the literature of the experts involved in an open format. Fuzzy Delphi method is described as follows:

Step 1: Assuming thatKinvitedexperts were to determine the importanceof theevaluation criteriaforthe variablesto bemeasuredby usinglinguistic variables(Table 1).

Step 2: Convert to all numbering linguistic variables into triangular fuzzy number as proposed in table 1. Assume that the fuzzy numbers are variable for each of the criteria for k_{th} expert for i= 1,….., m,j=1,…..n, k=1…..,k and $r_{ij} = 1/K\ (r^1_{ij} \pm r^2_{ij} \pm r^K_{ij})$

Table 1
Linguistic Variables and Their Equivalent Fuzzy Scales

Linguistic Variables	**Fuzzy Scales**
Verystrongly disagree	(0.0, 0.0, 0.1)
Strongly disagree	(0.0, 0.1, 0.3)
Disagree	(0.1, 0.3, 0.5)
Not sure	(0.3, 0.5, 0.7)
Agree	(0.5, 0.7, 0.9)
Strongly agree	(0.7, 0.9, 1.0)
Very strongly agree	(0.9, 1.0, 1.0)

Step 3: For every expert, use the vertex method to calculate the average distance between rij and rKij (see Chen, 2000). Distance between two fuzzy numbers is calculated using the formula:

$$d\left(\tilde{m},\tilde{n}\right) = \sqrt{\frac{1}{3}\left[(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2\right]}.$$

Step 4: According to Cheng and Lin (2002), if the distance between the averages of expert evaluation data is less than the threshold of 0.2, all considered experts have reached consensus. In addition, among the experts, where the percentage achieving group consensus is more than 75% (Chu & Hwang, 2008; Murry & Hammons, 1995), the researchers should proceed to step 5. If the data found otherwise, the second round FDM must be carried out.

Step 5: Aggregatefuzzyevaluationwith:

$$\tilde{A} = \begin{bmatrix} \tilde{A}_1 \\ \tilde{A}_2 \\ \vdots \\ \tilde{A}_m \end{bmatrix} \qquad \tilde{A}_i = \tilde{r}_{i1} \otimes \tilde{w}_1 \oplus \tilde{r}_{i2} \otimes \tilde{w}_2 \oplus \cdots \oplus \tilde{r}_{in} \otimes \tilde{w}_n,$$

$$i = 1, \cdots, m$$

Step 6: For each alternative, indefuzzicationfuzzyevaluation using formula A = 1/3 * (m1+m2 + m3).

Alternative ranking order of preference can be determined accordingto the value ai.

The Study Sample

Number of experts in this study is composed of 30 experts from 15 expert teachers, public lecturer 5, 5 and 5 training teacher lecturer and ICT experts. This is consistent with Jones and Twiss (1978) which gives the number of experts for delphi study is 10 to 50 experts. This is also highlighted by Adler and Ziglo (1996) that the number of experts is 10 to 15 expert if the expert consensus and consistency is high. Among the criteria required to become experts in this study are;

1. Specialist must have at least a bachelor's degree in their respective fields.
2. experts with expertise in the field of information technology (IT) or technology education for at least five years

or

3. Specialist must have experience in their respective fields at least for ten years.

Results And Discussion

Experts Consensus For Each Domain

In this study, the criteria used to evaluate the group consensus was based on the conditions of the agreement must be in excess of 75% (Chu & Hwang, 2008; Murry & Hammons, 1995). Before a consensus group, the distance between two fuzzy numbers is calculated by measuring the average deviation between the data evaluation experts use the following formula:

$$d\left(\tilde{m},\tilde{n}\right)=\sqrt{\frac{1}{3}\left[(m_1-n_1)^2+(m_2-n_2)^2+(m_3-n_3)^2\right]}.$$

Based on the data analysis of the threshold (dm, n) for all three domains showed that the percentage of agreement consensus group received three domains with the percent agreement was 92%. Therefore this research questions the group has reached a consensus agreement.

Table 3 shows the scores defuzzification for Pedagogical domain characteristics. Generally known that all features are domain level agreed by the expert group.

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Table 3
Pedagogy Domain Scores Defuzzification

Features Domain	Defuzzification Value	Rating
Teachers should have a strong pedagogical content knowledge.	21.80	1
Teachers must develop teaching support materials that are easily understood.	20.80	2
Teachers should provide clear instructions on each topic.	20.60	3
Teachers should ensure its presence online to be viewed by students.	20.00	4
Teachers should invite experts to visit the Facebook group to stimulate discussion process.	19.60	5

The analysis domain characteristics Pedagogy in the first position, a teacher must have a strong knowledge pedagogigal content with the score of 21.80 defuzzification. This is supported by Dewitt et al (2013), which outlines that the instructor should have a strong knowledge pedagogigal content. The researcher is of the opinion that teachers should act as a think tank with the professional knowledge they possess as mental and conceptual framework for all actions in learning on Facebook. Thus, the scholars stressed that teachers should be knowledgeable about pedagogy and knowledge in the field (Tengku, 2003; Nik, 1992).

Principles teachers should develop their teaching support materials that are easily understood by the defuzzification score of 20.80. Yes, teaching support materials are very important and should be easily understood, because the better the support material can help students understand what is to be learned (Dewitt et al, 2013).

The next principle is that teachers should provide clear instructions on each topic with the defuzzification score of 20.60. Researchers argue that clear instructions should be provided to the students clear about what students should do so the students were able to transfer the learning in the form of knowledge and skills learned in either formal or informal. This is commensurate with the argument Dewitt et al (2013) suggest that teachers use a simple procedure to perform task taps it helps students.

Next, the teacher should ensure its presence online to be viewed by students with the score defuzzification of 20.00. This can encourage the participation of students when teaching online and viewed by students (Dewitt et al, 2013). Ity Juesteru it is able to provide opportunities for students to interact and.

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Teachers should invite experts to visit the Facebook group to stimulate the process of discussion with the defuzzification score of 19.60 and the characteristics of the ninth, the teacher should invite experts to visit the Facebook group to bring another view of the worth of the defuzzification score of 19:40. Both views are in line with Dewitt et al (2013) suggest that teachers invite experts and visitors to "visit" to the online space to stimulate discussion and bring a different view of value.

Thus, referring to expert evaluation, the domain of pedagogical role of the teacher was seen as vital to the development of Principles Pedagogy In Facebook For Medium Teaching and Learning.

Domain Feature Technology In Teaching

Table 4 shows the scores defuzzification for domain characteristics of Technology in Teaching. Overall visible to score the defuzzification of a domain is the level agreed upon by experts.

Table 4
Skor Defuzzification Domain Teknologi in teaching

Features Domain	Defuzzification Value	Rating
Teachers should ensure that the use of technology to support information searching skills.	21.80	1
Teachers should have the basic knowledge to communicate on Facebook.	21.80	1
Teachers should be able to use the multimedia resources of the Internet to deliver advanced teaching materials on Facebook.	21.60	3
Teachers should use multimedia tools in accordance with current technology.	21.60	3
Teachers should create views that can stimulate students.	21.00	5

Defuzzification score analysis conducted, the researchers looked at the criteria that have the highest score defuzzification is the teacher must ensure that the use of technology to support information searching skills to the defuzzification score of 21.80. In the opinion of the researcher, the study on Facebook, teachers should emphasize strategies and skills for students to get the information and make a wise assessment of the sources of information differently. Of course, teachers should encourage students to identify and obtain information and advice from the community or experts from within or outside the country via the internet. Thus, a variety of teaching strategies can be used to generate ideas, and enhance the ability of students to manipulate the information that has been collected. Exploratory learning can be

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used by teachers to establish a link between the theory of constructivism in teaching and learning process in Facebook. This learning method allows the students to find and access information from multimedia encyclopedias or materials from the internet (Haynes & Holmevik, 1998). Through the collection of these materials, the information will be used to generate and test hypotheses in problem solving. In this context, the ability of Facebook is to promote the exchange of information among students on the one hand, and between students and teachers on the other and make it a potentially important educational tool (Sabry & Alshawi, 2009).

Next, the characteristics of the teachers should have the basic knowledge to communicate on Facebook with the score of 21.80 defuzzification. Researchers think teachers should have the skills to handle up to become a medium of teaching and learning. Thus professional teachers should apply information and communication technology in the classroom by integrating Facebook as a medium of teaching and learning which aims to improve the knowledge about the use of ICT. This opinion is right with Bordbar (2010), which emphasizes the efficient use of computer teachers was the main predictor in determining the success of ICT in teaching.

Next the teacher should be able to use the multimedia resources of the Internet to deliver advanced teaching materials on Facebook with the defuzzification score of 21.60. The finding is in line with the opinion of Rafiza and Maryam (2013) argue that the use of technology and sophisticated multimedia materials will be more appealing to students. However Mok (2007) asserts that teachers must equip themselves with the skills to use the Internet to obtain information about current teaching pedagogy development in addition to guiding students to use the Internet as a teaching and learning.

If look from literature review Mokhtar Nawawi (2005) revealed that the software is often used by teachers is Microsoft words. The majority of teachers surveyed are competent using Microsoft words of the electronic word processing and presentation, but less skilled in using the Internet, databases or other online communication and networking. Therefore, the researchers suggested that to make Facebook as a medium of teaching and learning, teachers need to improve the technical skills to fully maximize this social networking site.

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Next the teacher should use multimedia tools in accordance with the current technology defuzzification score of 21.60. Based on the analysis of the journal terdahuku featuring scholars also have formed an agreement that the level of ICT teachers are still not at a satisfactory level (Varsidas & McIsaac, 2001; Voogt et al, 2005). The researchers think the teachers do not need to use advanced multimedia but cukap mere use of multimedia tools in current technology that can attract students. This opinion is in line with Mahyuddin & Hasnisham (2011) which indicated the effectiveness of teaching depends on the extent of a teacher to integrating aspects of pedagogy, psychology and technology in the delivery of knowledge to produce a student who thinks critically and creatively.

Then the teacher must produce displays that can stimulate students with the score of 21.00 defuzzification. According to Siti and Shereena (2002) advanced multimedia technology innovation using a mix of computer hardware audio, video, text, graphics and animations that are able to produce good color and an attractive design as well as a more effective learning environment. With features multimedia technology, it is able to make the learning process more interesting and effective.

Domain Characteristics Of Instructional Design Process

Table 5 shows the scores defuzzification for domain characteristics of Instructional Design process. Overall, in view of the defuzzification score is in the level of experts agreed.

Table *5*
Skor Defuzzification Domain for Instructional Design Process

Features Domain	Defuzzification Value	Rating
Teachers should analyze the characteristics of the students.	21.00	1
Teachers should determine the objectives for a particular topic.	20.80	2
Teachers should choose the learning method on Facebook.	20.00	3
Teachers should use the learning materials on Facebook.	19.40	4
Teachers should encourage student participation.	18.70	5
Teachers should make an assessment.	17.90	6

Defuzzification score analysis conducted, the researchers found that the characteristics of domain principles which have the high score defuzzification is the teachers should analyze the characteristics of students with the score of 21:00 defuzzification. To analyze the characteristics of the students, there are three criteria that need to be identified which students

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identify common criteria consist of the number of students who want to be taught by the percentage of gender, the percentage of basic skills mastered by students in the subject you want to teach and students' background. The second criterion is to identify specific competency criteria disciple of students' prior knowledge. This aspect is very important in determining the ability of the student to understand the subject matter is so because every student has the level of existing knowledge of different subjects that vary according to the title of a topic. The third criterion is the learning styles. It refers to how a person interacts and reacts with the environment. Dunn & Dunn (1992) has developed a standard instrument to measure learning styles and preferred learning environments by someone. A group of experts and scholars have emphasized that learning style is very important in ensuring that students engaged in learning (Larkin-Hein & Budny, 2001; Graf, Kinshuk, & Liu, 2009; Yang & Tsai, 2008; Naimie, Saedah, Ahmad Abuzaid, & Shagholi, 2010). Arguments researchers also is a teaching and learning plan that takes into account the characteristics of the students in the lesson plans will make the learning process more effective. It is consistent with the assertion Jamaludidin, Baharuddin and Zaidatun (2003) which states that in developing multimedia instructional media, designers need to think about who will be the students and analyze the characteristics of students who will use the application or software.

Next the teacher should determine the learning objectives for a particular topic with a score of 20.80 defuzzification. Teachers need to specify the objectives to be achieved by pupils and students in accordance with the requirements and establishes behavioral changes that will happen to the students. Learning objectives in particular should be clearly stated to ensure that the applications to be developed with the guided direction and meets the requirements. Looking at this scenario, the researcher considers the objectives of the study should be clearly given to students so that students pay little attention to the social aspects found in Facebook and more focus on the learning aspect. It is a fitting historical literature review found that online discussions rarely move outside menjakaui exploration phase (Kanuka & Anderson, 1998; Luebeck & Bice, 2005; Meyer, 2003; 2004; Murphy, 2004). This most likely has to do with the nature and direction of teaching assignments provided (Garrison & Arbaugh, 2007).

Next the teacher should choose the method of learning on Facebook with the score defuzzification of 20.00. Selection of appropriate learning methods should be selected in accordance with the characteristics of the students, existing knowledge, learning styles and learning objectives. Acknowledged that learning the appropriate use of Facebook is the

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method of discussion and brainstorming. By this method, teachers should encourage students to access information and find answers through the internet and encouraging pupils to be active in the learning process. This opinion dsokong strong Rosafri & Shabariah (2011) stating that the discussion method using Facebook can enable learning environment and enhance student interest. These scholars also added that discussions identified learning method has advantages over other methods. This is because the method is applied to discussions centered learning students and provides opportunities for students to plan their own learning.

Next the teacher should use the learning materials on Facebook with the score of 19.40 defuzzification. Use of learning materials is a critical phase for any sophisticated media produced, it will have an impact either positively or negatively on learning. Among the measures that need to be done are as check, preview, review resource materials prior to use, prepare materials correctly, completely and fairly, plan the use of resources, provide a suitable environment to organize materials and resources within easy reach and use resources in optimal teaching and learning process. It is recommended that teachers provide a link or links on Facebook that can be accessed by students at any time so that students can relate the lesson taught by the other lesson. Jamaluddin & Zaidatun (2003) also pointed out where the use of such a teaching method that could identify the subject matter of the lesson taught by others.

Subsequently, teachers should encourage student participation in the defuzzification score of 18.70. To ensure that the learning process takes place, students need to be actively involved in learning activities on Facebook. Thus researchers suggest that teachers require students to participate in the teaching and learning process in Facebook by providing a written contract. The teacher should provide incentives and rewards to students during the learning process in Facebook. This is exactly the Dewitt et al (2013) which states the online learning environment requires the contribution of students to ensure students have the responsibility to participate in online learning with the use of contracts, incentives and rewards.

Next the teacher should make an assessment of the defuzzification score of 17.90. An assessment is made on the strength and effectiveness of media materials and teaching methods as a whole. An assessment is made to determine whether the instructional objectives are achieved or not. This assessment involves aspects such as student achievement, evaluate media and teaching methods. This assessment can be used by using instruments such as interviews, questionnaires, and checklists. The researcher considers this assessment allow

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teachers to self-assessment. Thus indirectly the teacher can think analytically, critically and creatively while reviewing lessons. In short, evaluation is a systematic procedure for observing the conduct or behavior of an individual (Cronbach, 1970).

It is clear from the findings on the instructional design process is very important in the design of learning materials on Facebook. Instructional design process is intended to provide guidance to plan and conduct teaching requires the use of media. Planning a rigorous and structured teaching will produce effective teaching. This is reinforced by Gagne (1985), learning occurs as a gradual process of development.

Principles Of Design Pedagogy In Facebook As Medium Of Teaching And Learning

Table 6 shows the standard Facebook design framework as a medium of teaching and learning that can be used in Secondary Schools.

Table 6
Design Principles of Pedagogy Facebook For Medium Secondary School Teaching and Learning

Domain	Features
Pedagogy	Have strong pedagogical content knowledge. Developing teaching support materials that are easily understood. Provide clear instructions on each topic. Ensure the presence of a teacher to be viewed online by students. Invite experts to visit the Facebook group to stimulate discussion process.
Technology In Teaching	Use technology to support information searching skills. Have the basic knowledge to communicate on Facebook. Using multimedia resources of the internet to produce sophisticated teaching materials on Facebook. Using multimedia tools in accordance with current technology. Viewers can stimulate pupils.
Instructional Design Process	Analyze the characteristics of the students. Determine the objectives for a particular topic. Choose learning methods on Facebook. Using learning material on Facebook. Encourage student participation. Make an assessment.

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Contribution Study

Studies have meneyenaraikan pedagogical principles which include pedagogy, technology in teaching and instructional design process as a guideline that can be used by teachers for use in a planned manner to enhance the teaching and learning process through Facebook. The findings obtained in this study can be used by teachers as a learning resource in the development of Facebook.

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Designing a Computer-Based Drug Decision Support System in NICU

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Abstract
Medication is one of the common treatment interventions in hospitals and plays a vital role in patients' health and recovery. Medication errors occur eight folds more in NICU, compared to adults' wards. Application of electronic drug decision support systems is recommended to diminish medication errors, improve evidence-based practice and increase the sensibility and accuracy in clinical decision making in all groups of the patients. The design process of NICU drug decision support system can be divided into two parts include: First stage: select of drug -related data and classify the information in paper files and then in Computer files (excel) to exchange to software language. Second stage: Conversion and transmission of medical information that entered in an Excel file to software database (MYSQL).The software runs on a conventional browser (without regard to platform).
These systems should not replace the human decisions or their experiences, but help them make the best decision in specific situations. In fact, these systems help the staff reduce the human errors. Therefore, a system was designed to be used by the nurses and physicians in NICU to reduce medication errors at any stage from prescription to after injection follow ups.

Introduction

The medication management process is complex, involving multiple steps and a variety of personnel (Koeppel, 2008). Medical errors are both costly and harmful (Jao, 2010). The intensive care unit is an extremely data environment (Turcka,2007).The intensive care unit meets the criteria for a high-risk environment, which requires specialized attention to reduce the risk of medical error(Board,2011). Among of intensive care units, neonatal intensive unit for many reasons are more important. Newborn infants admitted to intensive care units are particularly susceptible to medical errors (Lerner, 2008). Evidence-based decision-making is central to the practice of pediatrics (Fiks, 2011). Today, using of drug decision support systems it is recommended to reduce of this problems.

The clinical decision support system (CDSS) is widely used in an effort to reduce medication errors (Board, 2011). Computerized clinical decision support systems (CCDSSs) for drug therapy management are designed to promote safe and effective medication use (Hemens,2011).Clinical decision support (CDS) systems can safely and effectively support medication prescribing when they deliver relevant, unambiguous and actionable advice well integrated into patient care(Horsky,2013)

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This is not to suggest that CDS can prevent all medication errors, but such systems hold the promise of reducing a substantial number of ADEs by introducing automation at the time of ordering and by supplying "speedy, available, and usable algorithms that provide parsimonious, clear, concise and actionable warnings and advice. (Ridgely, 2012). Reviews of HIT-based CDSS have documented that effective decision support must be carefully designed to fit within clinical workflows (Fiks, 2011).So we decided to design a drug decision support system that meets the needs of the information drug in neonatal intensive units and in this paper we discuss and describe our project.

Aim

The aim of this study was Design and Development of the drug decision support system for neonatal intensive care unit.

Material And Methods

The design process of NICU drug decision support system can be divided into two parts include: First stage: select of drug -related data and classify the information in paper files and then in Excel format to import to software. This is part of project was done by a MS neonatal intensive care nurse and on the basis of the reference of neonatal pharmacology book (NEOFAX). In this stage 85 of most common of NICU drug were selected and then information about those drug were divided into 8 categories Included: Calculate the drug dose based on neonate's weight, administration, monitoring, preparation, precaution, solution compatibility, solution incompatibility and nursing attention. The remarkable thing is that this classification and extraction of Specific information was performed according to the most common nursing medication errors reported in the literature in the NICU. Second stage: Design the database for the software based on information collected and then importing Excel data file to software database (MySql).

Result

Design of drug decision support system software for use in the NICUs. The software is a web base application which can run on any conventional.

System Description

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NICU Drug decision support system is an electronic drug information system that have been designed and developed in both English and Persian for the convenience of users. The system includes the main page with five main icons: 1-Home 2-Drug information 3-Edit drug information 4- setting 5- About system.

Home:

This page provides general information about the system for users (nurses and physician). This information includes drug information system, source of drug information, how to use the system and access to information, type of drug information in this system. (Figure1).

Drug information:

In this page with select / enter the drug name(Figure2), select / insert birth weight , gestational age and post natal age(Figure3),suitable dose is calculated by the system. In addition to, other necessary information, such as solution compatibility, solution incompatibility, administration, monitoring, precaution, preparation, special consideration are available in this page (Figure4). This page is accessible by all levels of users.

Edit drug information:

In this page, two options include 1-Edit, 2-Rename are available for users. In this episode user can enter informations for new drugs by selecting the add option, if some drugs must added to the list of drugs (Figure5). Also if the drug is removed of medical system, user can remove the name of this drug to avoid possible errors. Also it is possible that to change the name of the drug, if it is necessary (Figure6).

Setting:

This settings is related to the software information system, and therefore to avoid potential problems, this setting just available for software liable of system (Figure7,8,9).

About:

By selecting this icon, users can access to general information about the system such as purpose of the design and development of drug decision support system, Steps of design and development of system and describe of how to access to support system and designers of system.

For using of this system the user can select the name of the drug from the drug List and then by selecting the prenatal age , postnatal age and weight(Factors affecting the neonatal drug dose), system calculates the drug dose and displayed with other information such as administration, monitoring, preparation, precaution, solution compatibility, solution incompatibility and nursing attention. Thus, in the shortest possible time, the user can access to one part or all of the important information about desired drug. Therefore Not only users

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will save time but also user can make an evidence based decision for promoting drug patient safety.

Conclusion

Improving the safety and quality of health care I has become a priority for our health system (Fiks,2011).Patient safety is a worldwide priority aimed at preventing medical errors before they cause death, harm, or injury.(Samra, 2011). A medication error is any preventable event that occurs during any stage of the medication use process that may cause or lead to inappropriate medication use or patient harm (Koeppel, 2008). The embedding of a CDSS into patient care workflow offers opportunities to reduce medical errors as well as to improve patient safety, to enhance drug selection and dosing, and to improve preventive care (Jao, 2010).Clinical decision support (CDS) systems can safely and effectively support medication prescribing when they deliver relevant, unambiguous and actionable advice well integrated into patient care (Horsky, 2013). These systems should not replace the human decisions or their experiences, but help them make the best decision in specific situations. In fact, these systems help the staff reduce the human errors. Therefore, a system was designed to be used by the nurses and physicians in NICU to reduce medication errors at any stage from prescription to after injection follow ups.

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Designing Business Law E Module Incorprating With Learning Styles

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Abstract
The purpose of this research is to design and evaluate the effectiveness business law e module .A total 27 business law students participate in this study. These are business management's students. Firstly these students were given 'need analysis'questionnaires ,secondly the e module was designed. The e module was design according to the 'need analysis'questionnaires from the student incorporating with 'student learning style. Lastly the e module was evaluated by the same students. The result proves that most of the content such as the definition of the related topics, sections involved, explanation about the videography, quizzes, tests and case exercises need to be included in the law module. Majority, the students agreed about the multiple answer questions, fill in the blanks and also the questions about the case study where the feedback shows the positive responds. However, some of the students also facing certain limitation during the learning of business law module. Among the students experience regarding the internet, they were really good in it. The computer lab facilities also provided in most of the students IPT. Based on the business law e module learning, 90% of the students has agreed about the contents such as the material of business law, delivery technique, simple language, notes in term of tables and figure, and also the presentation of current and previous knowledge in training activities. Furthermore, they were also agreed on the application skills as well as the theory skills in learning and teaching. The application of Cognitive Theory, Interactional, Behavioral and Constructivism also clearly understood by the respondents as the use of text, diagrams which to help students in Business Law, two-way interaction between students and learning materials. Cronbach`s alpha obtained also shows a consistency and reliability of the questionnaire. An average of 0.773 for each section has proven the consistency of the questionnaire in this study. It is highly encouraged that the Higher Ministry of Education , The higher learning education centre , lecturers ,designer to design and use e modules for business law students.

Background Of The Study

The business law module is one of the subjects that are challenging not only for students who follow this module, but also to a lecturer to teach this module. According to the Vida Allen (2007) most students are not interested in this and they do not cause a lot of trouble to create lecturer interest among students of the subject of the law on Institutions Of Higher Education. This statement is supported by Alice, (2005), which acknowledges that to teach the law, subject to students who are not from the city completely laws subject is unique and challenging. As a result, students will encounter problems when making the assignment or examination, the student will get a lower score in the exams and finally students and lecturers will be disappointed. Teach legal module to students from other areas will be treated as ' secondary ' and inferior substitute compared to teach law students from the law. (Bradney

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1998). Hence, therefore, a lecturer who teaches this module should be prepared to handle the problems that will be faced by students who were not from the legal department. These students are mostly from the field of Humanities, commerce or other areas and not able to deal with or cope with the subject of law.

(Alice, 2005) According to the current developments, pedagogical, legal Teaching And Learning Bill integration with e learning. Learning environment ' e learning ' is to assist students, especially students In Institutions Of Higher Education because in addition to the information given by the lecturers in the classroom, many students and Institutions Of Higher Education to conduct studies require varied sources of information. Hence, Ministry Of Higher Education has begun to play an important role and provide support and recognizes the importance of education technology e learning.

Ministry of higher education are issues technology in education can be seen from the winning policy was introduced. Among the policies introduced is related with e learning until the establishment of the Council Chief co-ordinator of e-learning at 12 Novermber 2007. The event was established a platform where experts from the entire public can share their expertise and skills to enhance and empower more e learning In Institutions Of Higher Learning. Determination in its efforts in developing the Ministry Of Higher Education education technology applied in higher education strategic plan 2, as shown above, where innovation and technology be taken seriously in international education. At the same time e-learning are also included in the strategic plan 2011-2015 Ministry Of Higher Education under critical agenda, this is because the Ministry Of Higher Education believe through e learning students will become active and responsible for his, and expected to produce responsible, free and independent and can compete internationally. Ministry Of Higher Education has also introduced a policy of ' lifelong learning ' where ICT is recognized as an enabler to lifelong learning. ICT must be to close all programs and activities of lifelong learning. The Government has also taken the initiative to expand broadband to be able to wield a e learning flexible room, affordable and effective. This web based learning to attract attention and interest the students to learn (Mohd Khairezan & Zarina Samsudin, 2005). In fact, this method becomes very useful for opening a space for students to interact in a synchronous and asynchronous through collaborative learning (Lau & Mohamad, 2002) and for students who are shy to ask in front of other students can participate actively as well as answer questions from above the line. This method can also overcome problems such as time, students are able to time outside the lecture time to interact with lecturers. Teaching and learning sessions can be conducted in a creative, interactive, use of audio, video and notes as

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well as learning materials can be given in advance of the date class. Teaching and learning will be more effective if the elements of learning style integrated together. Boyle (2008), a professor of law, using methods P&P lecture and learning collaborative, made a survey of the learning styles of the students of the law. Boyle found there are among the outstanding students in this subject, but there are also students who are weak. To overcome this problem, Boyle introduce learning based on learning styles. According to Carpenter (2010), many law school is currently examining the effectiveness of the traditional first year curriculum and modify the offering high-level courses so that these students are given the opportunity to develop personal and professional skills needed to practice law successfully.

E-Module

Integration Of Technology In Education

Advances in technology bring enormous impact on the development of teaching and learning in the classroom. There are various interpretations about the integration in education.

The integration of technology in education can be classified into three perspectives. The first perspective, the integration of technology in education are seen as learning outcomes (Hooper & Rieber, 1995). The second perspective, the integration of technology in education seen as pedagogy (Loveless, DeVoogh, & Bohlin, 2001). While a third perspective, integration of technology in education is seen as the process of determination of technology (Roblyer, 2006).

The first perspective of learning outcomes means technology as cognitive tools in learning (Hooper & Rieber, 1995; Theory, 2000). In other words, this perspective focuses on how and to what extent technology helps learning towards producing effective and meaningful learning. Next, the second perspective of pedagogy, means the ability of technology to change the pedagogical approach of the process of teaching and learning. In other words, perspective specify is focused on the role of teachers and students will vary with the technology used by teachers in teaching approach. While the third, namely the process of determination of perspective technology, means the process of determination of the suitability of the technology used and the way technology is used in teaching and learning. In other words, technology is seen as a tool which is capable of enhancing the quality of science education by helping to solve problems facing the learning students (Rohaida Mohd Seconds & Mahanom Mat Sam, 2008). The technology is often dealt with in the present education is related to the use of computer in teaching and learning. The use of computers in education can be categorized into three aspects, namely learn from the computer, learn about computers and

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learning with computers (Grabe & Grabe, 2004; Jonesson, 2000). Beyond learning about computer literacy, computer includes learning how to use computers, get to know computers and the manner of conducting a software. While learning with computers means that the computer used to help the formation of knowledge, exploration, learning by doing and learn to communicate.

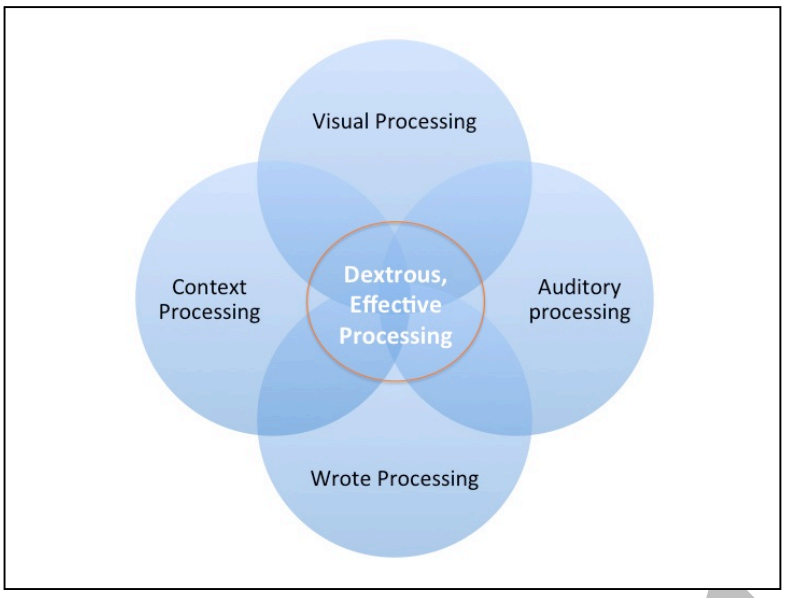
Learning Style

Claxton on and Ralston (1978: 12) in Evelyn c. Davis, Hafsah Nur and Sophia a. a. Ruru (1994) explains, everyone has their own learning style that involves visual styles, audio and kinesthetic. The style of learning, is named individual learning styles. Keefe (1979), in Chandrama Acharya (2002), define learning style as a combination of the characteristics of cognitive factors, effective and psychology which is the indicator someone make the perception and interact and respond to the natural surroundings. Kolb (1984), interpret learning styles as the manner in which students observe and process things. Some of them respond or learn something by way of using the senses and feelings (sensing and feeling), while other students learn how to think. Maulida Dina (2008), stated that learning styles are a combination of absorbing, arrange and organize this information. Learning styles not only in the form of aspect when facing help, view, hear, write and say but also aspects of processing information sequentially, global and analytic, left brain-right brain. Other aspects of learning styles is when respond something on the range of learning that absorbed in abstract and concrete.

VARK Learning style is an acronym from the Visual, Aural learning style, Read/Write and Kinestethic as in the figure below. Visual Learning style more focused on the visual aspects such as pictures, mind map, giving it a color that was different from the text. Learning styles more Aural aspects of the hearing focused on, such as recording learning, listening explanations from others, Learning Style Read/write more read-write stress on aspects such as making ' inclusion, handout, glossary. Learning styles Kinestethic more on physical touch aspects such as learning and practical subject (Fleming, Neil & Baume, David., 2006). While Abdul Hamid Mahmood, (2007) state VARK learning styles which consists of six aspects of learning styles the visual, auditory learning styles and learning styles Kinestethic useful for identifying groups of students visual, audio, Kinestethic , efficiency hand, groups and alone.

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VARK



Learning Style Model
Source : Fleming, Neil & Baume, David.,2006

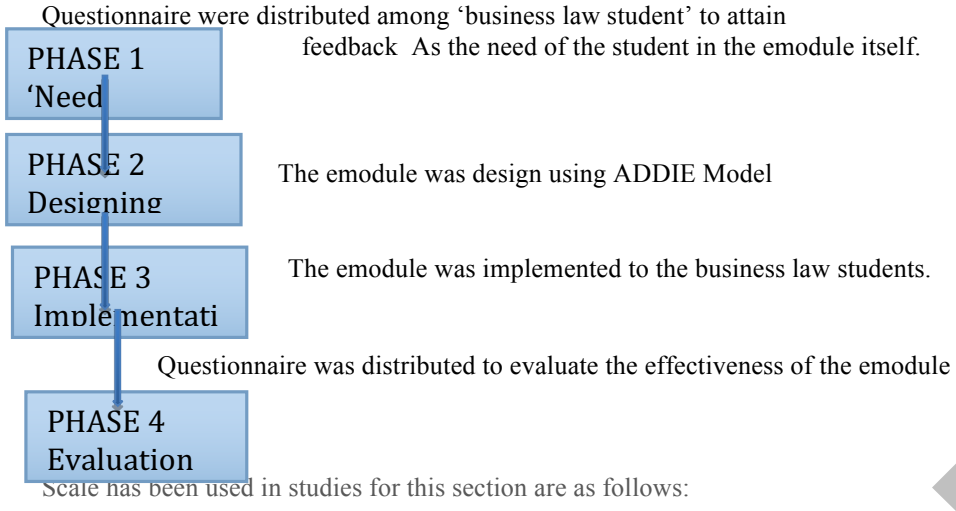
Research Method

Business Law eModule

The topic chosen for this is emodul ' offer and acceptance '.E -module business law is designed using blogspot.Where e-module is divided into several parts for students using this e-module where (i) a note for students love reading and writing (ii) info video with graphic elements to attract the attention of students like visual look and listen (iii) case study is to help students who prefer to learn by problem solving with using real life situations (iv) revision quizzes (v) and (vi) the game. Part (iv) and (v) is to help students further enhance knowledge and more prepared for the exam to be occupied.While the last part is the game so students more interested in learning through games. E-module business law can be accessed with the using link:

mylawofcontract.blogspot.com

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Scale has been used in studies for this section are as follows:

1-Strongly Disagree 2 Disagree 3-Agree
4-Strongly Agree

Analysis of the average For each part of table 1: Average Frequency Tables For each Item

Item	*A*verage	standard deviation	N
Part a: Activate previous experience/knowledge	3.1296	0.40650	27
Part B: demonstration of skills and content learning materials business law site Emodul business law	3.2163	0.29459	27
Applications Cognitive Theory	3.2744	0.25256	27
Instructional Theory	3.3333	0.32392	27
Behaviorism Theory Application	3.3556	0.46520	27
Constructivism Theory Application	3.1885	0.26914	27
part D: the integration of skills in business law	3.3519	0.31209	27

Refer to table 1: Average Frequency For each Item above, on average, showed respondents satisfied with each statement questioned in this study, especially in the Theoretical Applications with the highest average Behaviorisme 3.3556 ± 0.4652. For Cognitive Theory, Applications and Interaksional Konstruktivisme also showed positive feedback among the respondents. Findings for other divisions also reflect the positive feedback with an average of 3.1296 up to 3.3519. This explains that the respondents are satisfied with the contents of the questions a survey Evaluating Emodul business law in Higher Learning Institute.

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Variable	Alpha Cronbach's
Skills and experience of students using the internet material	0.758
business law module to be loaded in the Learning Portal module business law	
i) Content of business law emodule	
ii) presentation content learning materials	0.930
iii) type of training needed by pupils in learning	0.876
iv) Activities required by the students	0.688
v) Form of Evaluation questions of business law module	0.770
vi) Information sources needed	0.832
Law learning problems faced by the students	0.660
	0.925
evaluating emodul business law	
i) Part A	0.845
ii) Part B	0.814
iii) Part C-Cognitive	0.732
vii) Part D	0.531

Correlation Analysis

Table 3 : Correlation table for each item of developing and evaluating business law emodule

Item	Part A	Part B	Part C-ATK	Part C-ATI	Part C-ATB	Part C-ATKo	Part D
Part A	1						
Part B	-0.094	1					
Part C-ATK	-0.418*	0.570**	1				
Part C-ATI	-0.294	0.360	0.251	1			
Part C-ATB	-0.212	0.550**	0.324	0.759**	1		
Part C-ATKo	0.153	-0.074	0.272	0.465*	0.440*	1	
Part D	-0.373	0.093	0.100	0.728**	0.734**	0.604**	1

Part A: Activate previous knowledge/experience

Part B: demonstration of skills and content learning materials business law site Emodul Business Law Section c: Application skills and application of Theory of teaching and learning-i. Application of Cognitive Theories

II. Application of the theory of Instructional

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III. Application of the theory of Behaviouris

IV. Theoretical Application Constructivism

Part D: the integration of skills in business law

The Pearson correlation is one method to measure the strength of the correlation between two ítem. For this study, Pearson correlation was used to view the value of the strength of the correlation between each ítem.

Overall, all the pair correlations above shows the value of positive and negative. For the correlation between Theoretical Applications and Instructional recorded a level of behaviorism correlation is high with 75.9% (-at a rate of 0.01). Application of the theory of Behaviorisme also accounts for the correlation value-even on a simple level high (55%) with part B: demonstration of skills and content learning materials business law site of business law Emodule .

Part D: the integration of skills in business law also recorded moderate correlation value for a given number theoretical applications, such as applications Interaksional Theory, behaviorism antecedents (73.4%) and Kostruktivisme (60.4%) respectively. Each also mencatatan-value (at rating 0.01).

However, it does not show strong correlation value for application of Cognitive Theories with a very low correlation value, i.e. at a rate of 10%.

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Conclusions

The Business Law Emodule was developed for the purpose of helping students to understand better the subject or module. It is a platform for students to expolre the subject at anytime, anywhere and be helpful during revision period. The emodule was also designed in such away to fulfill the different learning styles of the students. The result shows positeve impact towards the usefull of the emodule. For future research , it is suggested the emodule to be stressed upon the application of more digital emodule which will increase the interest for the students to learn and understand theorithical subjects.

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Designing Effective Curricula With An Interactive Collaborative Curriculum Design Tool (Ccdt)

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Abstract
Guided by the principles of the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design (ID) model, this creative instructional product presents a learning/teaching approach that is fundamentally constructivist. For the purposes of designing effective instruction in an academic preparation course, a *Collaborative Curriculum Design Tool* (CCDT) was chosen as the major educational technology tool. The target audience includes adult English as a second language (ESL) students preparing for undergraduate and/or graduate schools in the U.S. Based on this specific learner group in this academic preparation course, the primary learning objective of this design is to help students improve their academic English skills in various domains. Technological tools selected to achieve this learning goal consist of those that promote the development of each competency in the language. There are numerous software programs employed to support students' vocabulary, reading, and writing skills development, in addition to assisting with their improvement in listening and speaing fluency.

Key Words: CCDT, instructional product, constructivist learning approach, ADDIE, ID model, effective instruction, adult ESL students, academic preparation course, technology tools, development of academic English skills in various domains, vocabulary, reading, writing, listening, and speaking competencies.

Introduction

Continuous technology use both inside and outside of the classroom is a driving force behind this instructional product, which is empowered by various audiovisual technologies that are designed to promote students' improving their academic English skills in all skills (i.e., vocabulary, reading writing, listening, speaking). In order to reach this goal, a comprehensive unit lesson curriculum (i.e., Unit 7, Microbiology) was created. All of the technologies that assist with ESL students' meaning making during their learning were listed in the CCDT in a way that the reader can appreciate for what academic skill enhancement a particular technology was utilized. Besides this unit curriculum design generated on the CCDT, there is also the second technology (i.e., Prezi, presentation software) via which

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almost all components of the design were demonstrated. Watching this presentation, the viewer can have a quick overview of all of the elements that went into the unit curriculum design produced through CCDT. The latter is an interactive, animated technology where the guiding principles of the selected instructional model, ADDIE, and constructivist learning theory on which this unit curriculum design was grounded can be observed. Considering that learning is an activity which is defined as "a persisting change in human performance or performance potential" (Driscoll, 2005, p. 9), this particular instructional design appears to deliver this, justifying the guiding principles of the aforementioned theoretical learning framework (i.e., constructivism) and the instructional model (i.e., ADDIE).

Achieving Meaningful Learning With The Constructivist Learning Approach

Constructivism (Vygotsky, 1978) is a theoretical framework which refers to the fact that when guided by the instructor or facilitator, students can gradually improve their performances both inside the classroom and outside, where they begin to direct their own learning, construct their own meanings from the given topic, and thus master academic skills necessary for them to incorporate into real-life cases. The constructivist learning approach, coupled with informal, digital media-rich educational practices in a world of digital technologies today gives learners "more control of what, where, and how they learn and usually involves intrinsic motivation" (Reiser & Dempsey, 2007, p. 167). It leads to meaningful learning in class with learners' collaborative, interactive work in group-based settings (Gagne, Wager, Golas, & Keller, 2005). Given that a plethora of ID practices in the literature aim at human performance improvement (HPI)—or human performance technology (HPT)—(Gagne et al., 2005; Reiser & Dempsey, 2007), it should be no surprise that constructivism is a learning theory that is intertwined with this learning objective. Such learning is also called self-directed learning that, if supported with innovative learning tools, can yield higher learning outcomes on the part of the millenials (Dede, 2011).

Addie: A Popular Id Model

As they seek to facilitate learning/teaching practices that are personalized and meaningful for learners, instructors can greatly take from ADDIE, which is a highly popular ID model for designers of effective instructional/training programs (Reiser & Dempsey, 2007). Especially when designed based on the underlying principles of ADDIE, all educational activities in any industry sector or educational field can yield positive learning outcomes. Under the umbrella

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of ADDIE, a solid analysis of needs or problems plays a crucial role in defining learning objectives or goals that the designer, trainer, or instructor is to set for his/her learner group. It is a well-known fact that the five essential elements ADDIE consists of have been modified from other ID models over the course of time due to the changing learning styles (Bloom, 1968), needs, and demands of today's learners directing their own learning in the digital age, and with the approaches to learning that have had to adjust to such transformation in education. Nevertheless, it is a modified, albeit a reliable guide to those who desire to bring to life authentic educational products with the sole purpose of enhancing their learners' academic performances both inside and outside of the classroom. Awareness and execution of these five core components can yield positive learning outcomes if all teachers and educational leaders are on board with robust technology integration into instruction. Identifying learning objectives is critical in an ID process. Gustafson and Branch (1997) pointed out that all of the instructional systems design (ISD) approaches determine a learning objective, which is a very necessary component of the entire design process. All of the five phases of ADDIE are presented in a linear manner. According to Reiser and Dempsey (2007), throughout the life of a design project, data are collected and the development team evaluates these data, gaining insights into them. During this process, "it is often necessary to move back and forth among the activities of analysis, design, and formative evaluation and revision. Therefore, the iterative and self-correcting nature of the ID process emerges as one of [ADDIE's] greatest strengths" (p. 11). It is thus undoubtedly that ADDIE stands out as a solid design guide to an array of preceding and current ID models (Reiser & Dempsey, 2007) not only in the field of second language acquisition and teaching—the focus of this study—but across disciplines, as well.

Impact Of Technology Supported Id Practices On Mastery Learning

Effective instruction is facilitated by solid design approaches that play a crucial role in the way instruction is delivered to a particular group of learners. The process of ID cannot be considered without guiding principles of instruction, models, and certain theories. Instructors' own epistemological perspectives, combined with their knowledge of certain psychological and theoretical frameworks often lay the foundation for the extent to which they create innovative and ingenious instructional products for their learners. Merrill (2002) stressed that instructors' knowledge of first principles of instruction can tremendously help them with the design of instruction which is learner-centered and based on solving real-world problems.

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Reiser and Dempsey (2007) asserted that instruction can emerge as effective, efficient, engaging, interactive—and even fun—in learning contexts where existing knowledge is the propeller of the new one, when it is integrated into students' world, when it is demonstrated to them as they gain mastery of their own learning (Gagne et al., 2005), and when they end up applying their newly acquired knowledge in real-life settings. Defining students' learning styles prior to the design of instruction can be a good reference point for designers who strive to achieve their students' mastery in learning. Under this context, educational technology emerges as an indispensable part of such instructional practices, building a bridge between traditional and progressive teaching approaches and activities. Van Merriënboer (1997) emphasized that instructors can positively influence learning outcomes in a given context if they lead their learners to gain complex cognitive skills, and if audiovisual technologies are made a substantial aid in this process.

A Collaborative Curriculum Design Tool (Ccdt)

CCDT can be described as an online, interactive design tool utilized to craft effective curricula, unit lessons, or other instructional products (see Figure 1). It is a tech-savvy tool that helps educators share their designs with their colleagues or other educators—not with learners—via a common platform, which lends itself to a collaborative environment of sharing theoretical frameworks, learning and pedagogical approaches, as well as hands-on instructional practices with one another. Easy access and clear interface of the tool makes design engaging and fun for educators as they weave their pattern by using each of the following components under the *Teaching for Understanding* (TfU) framework: Throughlines, Generative Topics, Understanding Goals (UGs), Performances of Understanding (PoUs), Ongoing Assessments (OAs), and other essential elements. Overall, CCDT helps facilitate instruction in any discipline and in any educational, training, or professional development setting. By use of CCDT, instructors, instructional/curriculum designers, trainers, educational technologists, and all others interested in creating innovative, effective, and engaging instructional materials for their learner groups can easily create and access an account for their course on the web. They can also continuously edit their design work through this platform, and after finalizing it, they can electronically publish the completed design work, which is similar to Google Drive or Cloud platform—yet a less complicated one—in the virtual environment. In other words, instructors using CCDT do not

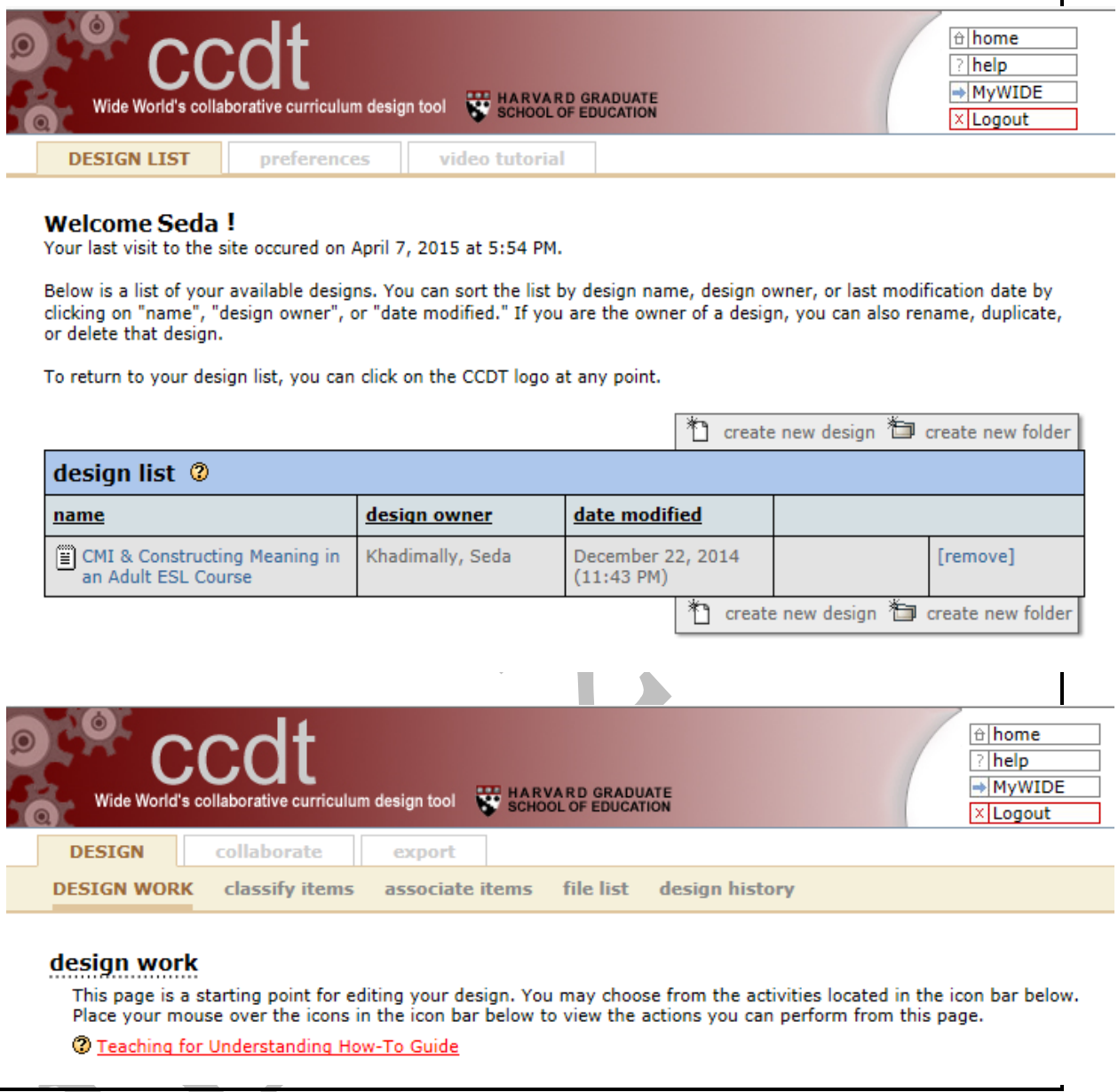
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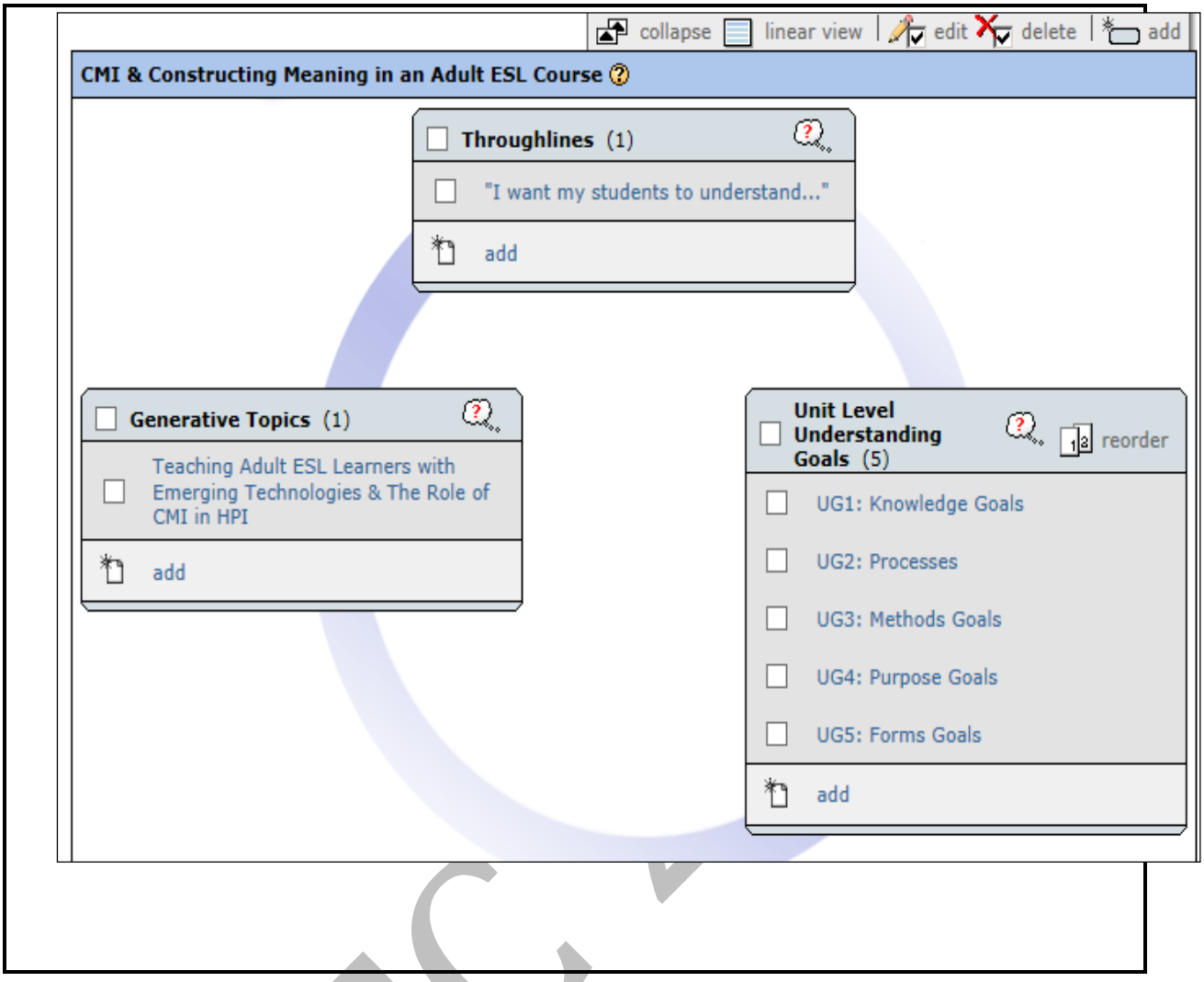
need to be concerned about losing their design work, for they will not be saving their design work on a hard drive.

The particular unit lesson created via CCDT for the purposes of this paper focuses on a content-based, academic adult ESL course. However, as noted earlier, CCDT can be effectively and efficiently used across disciplines by those involved in creating innovative and authentic educational products designed, developed, delivered, and evaluated with a myriad of technologies. The learning objective with a unit lesson or curriculum created with CCDT and under the guiding principles of the TfU framework almost always proves that target learners can gain a comprehensive understanding of the topic covered throughout the course. Moreover, it is also noteworthy that there are two particular advantages of implementing CCDT for an effective unit lesson before, during, and after its creation: 1) Due to the linear and systematic nature of the TfU framework, CCDT guides educators and other learning/teaching agents in their own fields with clear guidelines and a sound pattern (i.e., lesson plan, syllabus, curriculum, etc.), which they can easily follow in a certain learning/teaching environment; 2) The tool also assists design creators with building or developing ID skills necessary to create learning/teaching settings that are collaborative and authentic for specific learner groups. It is pivotal that designers keep all of these features and the central elements of CCDT in mind, especially due to the benefits it provides the educators with in the process of achieving specific learning goals they set for their learners—for the purposes of this paper, adult ESL teachers, in particular. Thus, this paper highlights the characteristics—or the three Ps of CCDT—a practical, progressive, and participatory curriculum design tool. It is also imperative that second language educators appreciate CCDT's conformity with theoretical and pedagogical principles addressed in this paper, as well as its congruence with currently popular ID models and computer aided ESL instruction. Therefore, educators who desire to transcend their current instructional practices with educational technologies can substantially benefit from CCDT, which, for the purposes of this paper, was portrayed as a knowledge-building, innovative, tech-savvy ID tool hoped to be a beacon to ESL instructors, to those working in the field of second language acquisition supported with technologies, or to individuals engaged in the field of education that simply desire to create instructional products that can emerge as highly engaging, meaningful, and fun for their students.

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Figure 1. An Exemplary Unit Lesson Designed with the Collaborative Curriculum Design Tool (CCDT)




collapse
linear view
edit
delete
add
CMI & Constructing Meaning in an Adult ESL Course
Throughlines (1)
"I want my students to understand..."
add
Generative Topics (1)
Teaching Adult ESL Learners with Emerging Technologies & The Role of CMI in HPI
add
Unit Level Understanding Goals (5)
reorder
UG1: Knowledge Goals
UG2: Processes
UG3: Methods Goals
UG4: Purpose Goals
UG5: Forms Goals
add

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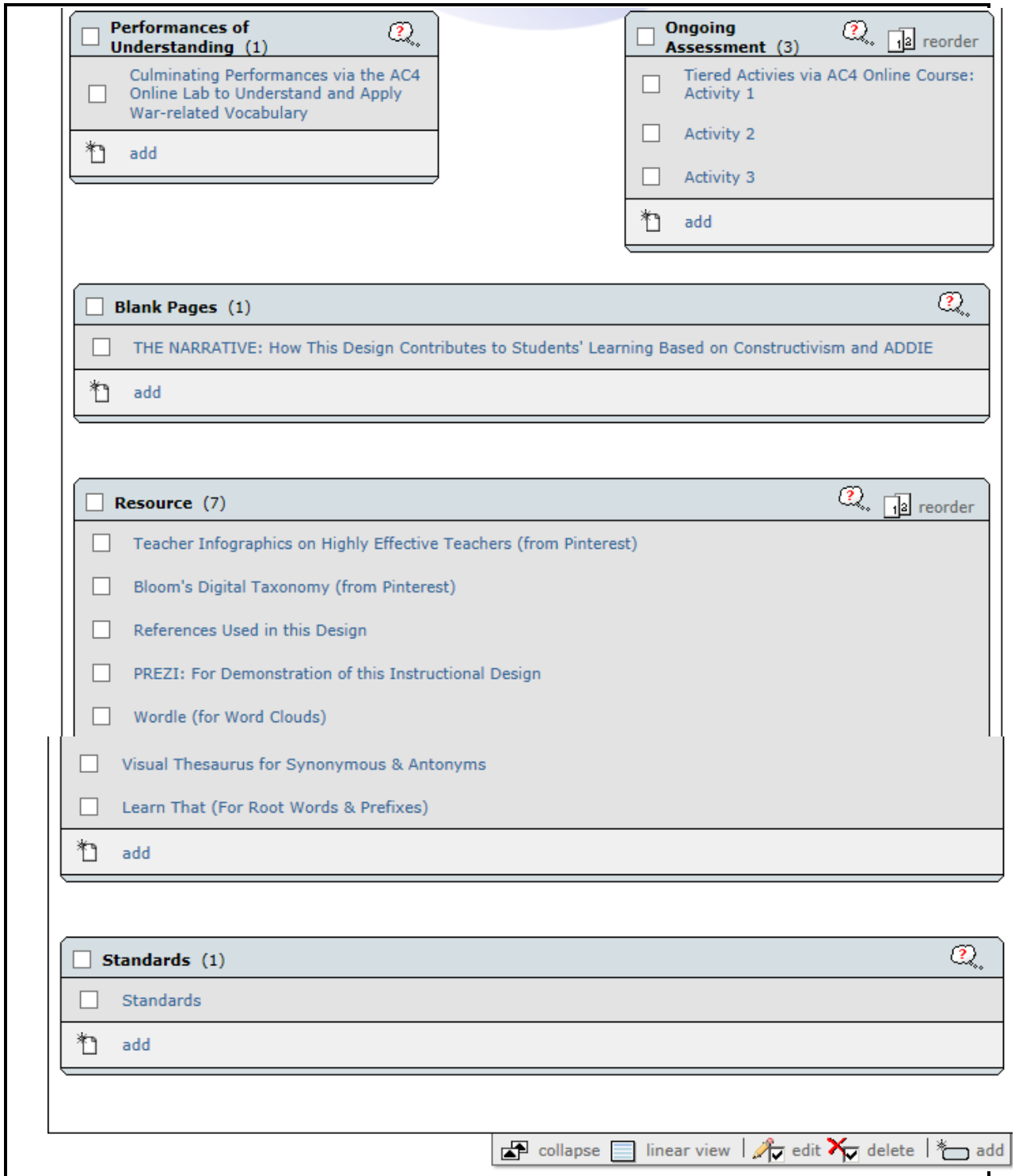


Figure 1. This visual demonstrates an example of an instructional product designed through CCDT for a group of ESL learners. Each module (i.e., throughlines, generative topics, performances of understanding, ongoing assessment, and other components) embedded under the TfU framework includes unit-level content and leads to a deeper and holistic understanding of the unit designed for meaningful learning.

Throughlines

In this unit, all activities were tiered and differentiated, based on the ESL students' learning domains (Bloom, 1968), styles, interests, and readiness levels. Addressing these criteria can help the students figure out how effectively and efficiently they grasped the generative topic, *Fighting Infectious Diseases*, in unit 7, *Microbiology*, by using *war* as a metaphor. They are expected to appreciate the differences among battle-related vocabulary embedded in the unit. The most important thing for the students to understand about this topic is the subtle nuances among each

war-related word such as battle against, wage a war against, be overcome, combat, attack, first line of defense, keep a disease under control, contain, be out of control, outbreak of a disease, be vulnerable to, and be susceptible to a disease.

Throughlines (see Figure 2) allow the ESL teacher of this academic English course to set the following learning objectives for her students. Below is the list of these goals and expectations that the educator of this design most wants her students to understand at the end of this 6-week ESL course:

1. Students will internalize their knowledge in the academic topic in unit 7 (i.e., Microbiology), *Fighting Infectious*

Diseases, and construct their own meanings from this topic;
2. By using asynchronous and synchronous technologies, the students will engage in an interactive learning

environment where they will not only interact and communicate with the instructor, but also with their peers.

Technology supported learning will help the students understand the meaning and value of communication

in a student-faculty and faculty-faculty interaction (Reiser & Dempsey, 2007). At the end of the unit under study,

(i.e., Microbiology), all students will also be able to demonstrate enhanced fluency in writing and listening. They

will additionally build on their advanced academic vocabulary repertoire. As the instructor encourages her

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students to utilize a variety of technological tools both inside and outside of the classroom, she wants her students

to make their own meanings from the topic. As they construct their own meanings from the given subject matter

over the course of six weeks, students will eventually become self-directed, intrinsically motivated learners

(Vygotsky, 1978). As she provides them with an array of authentic learning/teaching materials in vocabulary,

reading, writing, listening, and speaking competencies, her students will use various educational technologies

during this learning process. With this type of instruction, she wants her students to transform into constructivist

learners apt to build authentic meanings, which can lead to their discovery of a type of instruction that is effective,

fun, engaging, efficient, and appealing (Reiser & Dempsey, 2007) for themselves.

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Figure 2. Throughlines

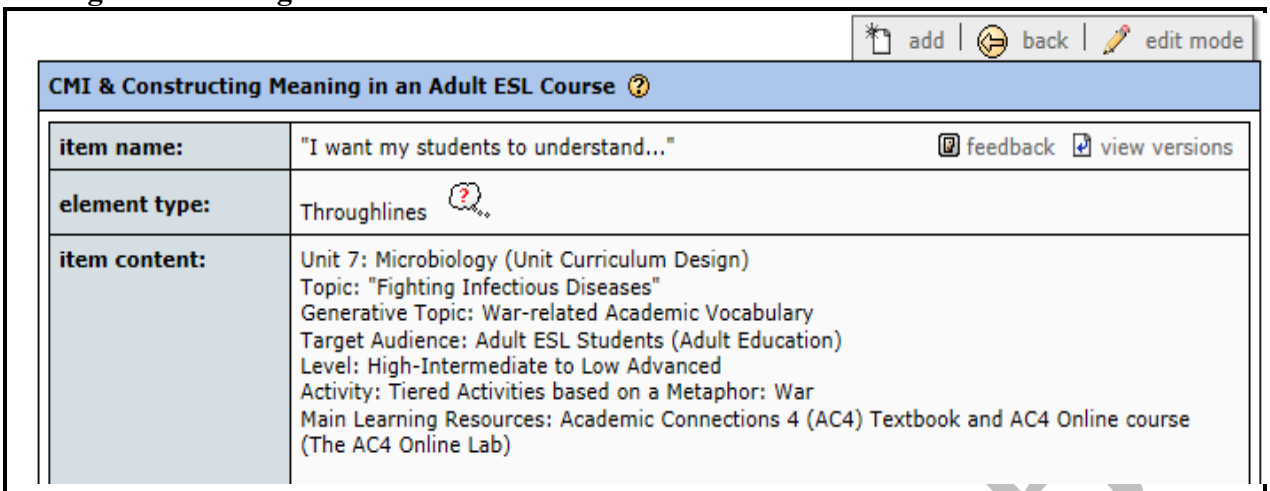


Figure 2. With these overarching goals, the students are expected to develop a deeper understanding of the content from the given unit (i.e., Unit 7: Microbiology) and the particular topic, *Fighting Infectious Diseases*. Throughlines will be closely related to the Understanding Goals (UGs) for this specific unit and vice versa.

3. The ESL instructor wants her students to acquire all skills in English through the use of below educational

technologies:

ePortfolios involving digital videos, creating personal narrative videos they can edit and publish (e.g., iMovie,

Microsoft Office, YouTube, Final Cut Pro, etc.), designing blogs and wikis, using the word cloud tool Wordle

(see Figure 3), and online dictionaries such as Visual Thesaurus, JTW, etc.—so they can build upon their

advanced academic vocabulary skills—designing interactive presentations with Prezi, Microsoft PPT, or Adobe

Presenter, using social networking tools such as FaceTime, LINE, Google Chat, Skype, Adobe Connect, Lexly,

Twitter, and Facebook in order to socially connect.

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Figure 3. Unit 7 Vocabulary Words via Wordle.net, an Online Word Cloud Tool

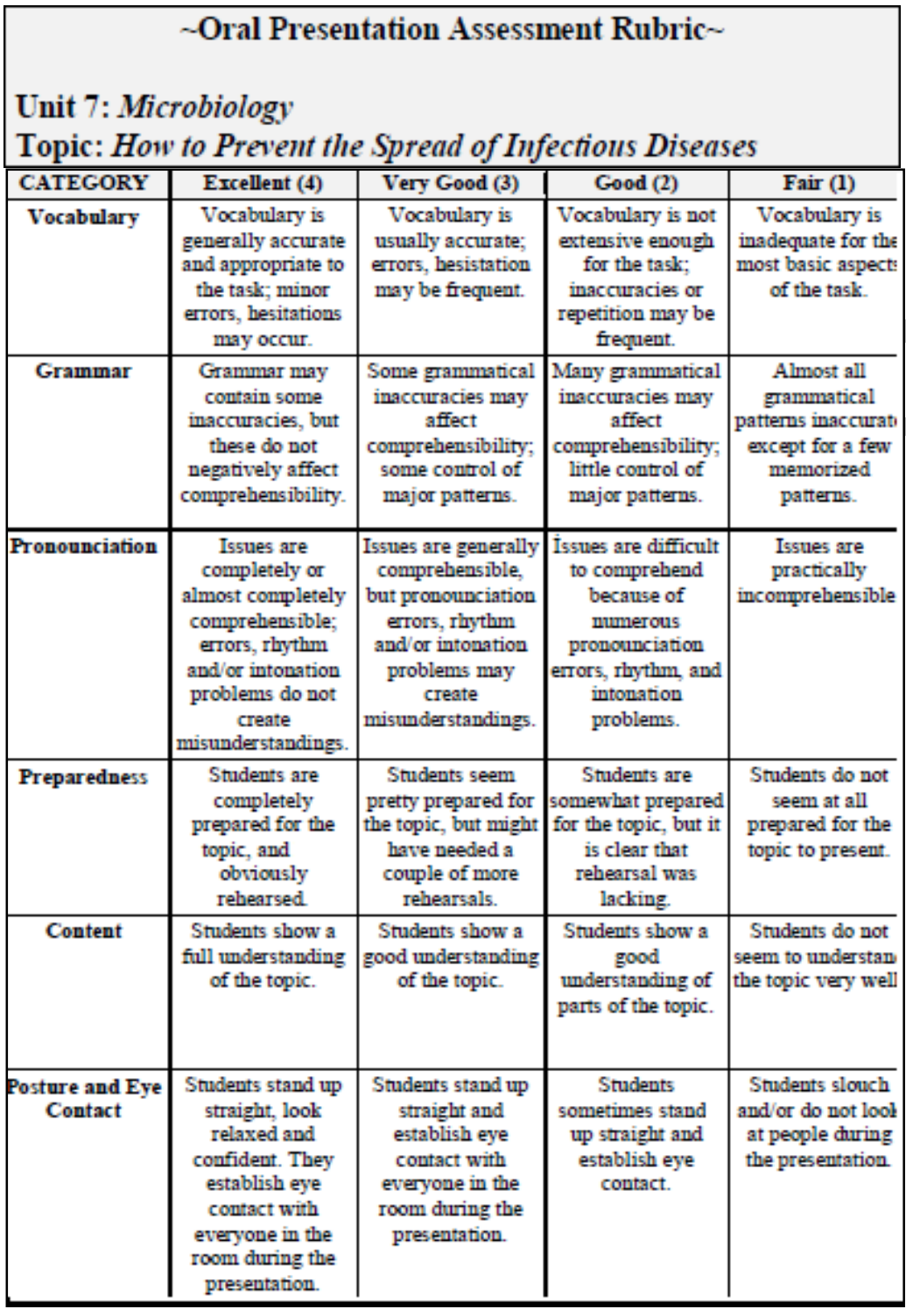


Figure 3. By use of this tool, the most frequently used advanced academic words derived from the unit vocabulary are designed and presented to ESL students in a way that they will gradually begin to digest these words, and build upon them as they engage in various vocabulary, reading, writing, listening, and speaking activities and tests. What stands out by use of this technology is that the students will ultimately end up mastering academic vocabulary pertinent to the topic, *Fighting Infectious Diseases*.

4. The instructor also wants her students to showcase their knowledge with a culminating digital portfolio project at the end of this unit. By preparing an e-Portfolio, students can demonstrate their performances in various skills in the English language, based on their thorough understanding of topics. With this project, they can display their newly gained knowledge of the unit vocabulary words, in addition to their writing, listening, and speaking competencies (see Figure 4 for assessment of ESL students' speaking fluency).

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Figure 4. Oral Presentation Assessment Rubric



~Oral Presentation Assessment Rubric~

Unit 7: *Microbiology*

Topic: *How to Prevent the Spread of Infectious Diseases*

CATEGORY	Excellent (4)	Very Good (3)	Good (2)	Fair (1)
Vocabulary	Vocabulary is generally accurate and appropriate to the task; minor errors, hesitations may occur.	Vocabulary is usually accurate; errors, hesistation may be frequent.	Vocabulary is not extensive enough for the task; inaccuracies or repetition may be frequent.	Vocabulary is inadequate for the most basic aspects of the task.
Grammar	Grammar may contain some inaccuracies, but these do not negatively affect comprehensibility.	Some grammatical inaccuracies may affect comprehensibility; some control of major patterns.	Many grammatical inaccuracies may affect comprehensibility; little control of major patterns.	Almost all grammatical patterns inaccurate except for a few memorized patterns.
Pronounciation	Issues are completely or almost completely comprehensible; errors, rhythm and/or intonation problems do not create misunderstandings.	Issues are generally comprehensible, but pronounciation errors, rhythm and/or intonation problems may create misunderstandings.	Issues are difficult to comprehend because of numerous pronounciation errors, rhythm, and intonation problems.	Issues are practically incomprehensible
Preparedness	Students are completely prepared for the topic, and obviously rehearsed.	Students seem pretty prepared for the topic, but might have needed a couple of more rehearsals.	Students are somewhat prepared for the topic, but it is clear that rehearsal was lacking.	Students do not seem at all prepared for the topic to present.
Content	Students show a full understanding of the topic.	Students show a good understanding of the topic.	Students show a good understanding of parts of the topic.	Students do not seem to understand the topic very well
Posture and Eye Contact	Students stand up straight, look relaxed and confident. They establish eye contact with everyone in the room during the presentation.	Students stand up straight and establish eye contact with everyone in the room during the presentation.	Students sometimes stand up straight and establish eye contact.	Students slouch and/or do not look at people during the presentation.

Figure 4. ESL students' speaking skills regarding unit-related topic, *How to Prevent the Spread of Infectious Diseases*, are assessed based on the given rubric criteria—from fair to excellent.

5. The instructor of this academic English course finally wants her students to socially interact with both their peers

and herself, by sharing a common culture of both content and method, and thus build a knowledge-building

community of ESL learners. Gagne et al. (2005) stressed that group-based, interactive instruction helps students

connect and build a community of digital learners in today's world of technology.

***Through Grouping*:**

A. The students will derive context-related meanings of academic words, and appreciate what metaphorical use of

the language is;

B. They will appreciate the application of war/battle-related vocabulary in real-life settings;

C. The students will also develop an understanding of certain grammatical structures used to facilitate their

academic vocabulary use in context and writing activities.

Generative Topics

The unit topic to be taught in this six-week course is *Fighting Infectious Diseases* in unit 7. There are eight units in sequence in the textbook, *Academic Connections 4 (AC4)*. The textbook involves a built-in online lab (AC4 online), which is an interactive course that provides a variety of skills-based activities to ESL students in all units. The course will heavily rely on supplemental activities through Computer-Mediated Instruction (CMI). The online course will provide the ESL students with hands-on applications as they acquire and implement vocabulary skills, reading, writing, listening, and speaking. All students will benefit from the AC4 online course, which is expected to yield higher learning outcomes in all aforementioned skills. CMI is effective particularly on reading, vocabulary, listening, and speaking fluency. During the design and implementation of this unit curriculum, the instructor will be aware of the fact that technology has a highly positive impact on second language acquisition. Unit instruction via CMI will particularly be critical for her ESL students, for they can more easily—and audio visually—scaffold their learning in each learning domain every time they come across a new concept or expression throughout their progress in this unit (i.e., Microbiology). This will greatly contribute to their performance improvement

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(Gagne et al., 2005), as competent language learners. CMI will also assist the students as they associate each term with their previous experiences, and thus construct their own meanings (Vygotsky, 1978; Reiser & Dempsey, 2007) from within the subject matter.

The instructor's hands-on use of this online lab and getting her students to perform activities both inside and outside of the classroom environment will greatly contribute to their mastery learning (Bloom, 1968, as cited in Gagne et al., 2005). With respect to this, it is imperative that educators remember that in a digital world of learning and teaching, they must design and evaluate programs that promote students' mastery learning in given tasks and learning objectives. Indeed, from a scholastic point of view, these should be educational programs consistent with progressive learning styles of the millenials (Dede, 2011). Also, from an instructional viewpoint, Gagne et al. (2005) pointed out that "the idea of mastery requires a change in thinking about instructional design as well as assessment" (Bloom, 1968, as cited in Gagne et al., 2005, p. 274), which is exactly what the instructor of this course seeks to accomplish on her part with her curriculum design both during and after the course completion. Especially that she incorporates the technology component of the AC4 course into her students' learning processes will be a substantial aid for her students' *performance improvement* (Reiser & Dempsey, 2007). She is particularly cognizant of the fact that Human Performance Improvement (HPI) or Human Performance Technology (HPT) is a "special field that has evolved professionally in the last 15 years, and can assist individuals and organizations to achieve workplace success" (Reiser & Dempsey, 2007, p. 143). Online technologies that she will employ together with her students throughout the unit (i.e., Microbiology) will solidify her students' appreciation for the value of all generative topics. Use of AC4 will considerably help her learner group to enhance and improve their academic performances in all English skills, which is highly consistent with the guidelines of the HPI/HPT ID model (Reiser & Dempsey, 2007).

Defining an infectious and a contagious disease, and the subtle differences between the two terms will be one of the foci during academic vocabulary activities. Other generative topics relevant to the unit will be acquisition of and resistance or sensitivity to infectious diseases, and the ways to avoid or avert the process that occurs in everyday life. In this context, such generative topics will help the course instructor's students appreciate how germane the topic is in today's world. Other generative topics will involve students' comprehension of and

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differentiation among the following vocabulary words: pathogens, contract infectious diseases, epidemic, pandemic, symptom, syndrome, resist, susceptible, vulnerable, vaccination, and several others in both the AC4 textbook and AC4 online lab.

With this unit design, the students will also learn about other pertinent vocabulary regarding humans' combat with infectious or communicable diseases (e.g., battle, wage a war against, overcome, attack, first line of defense against, keep under control, resist, etc.). They will also understand speakers' main discussion points as they listen to unit related lectures. They will comprehensively grasp the entire content with reading passages about the topic.

This unit is worth learning, because the students will not only understand content-based academic skills, unit concepts and technical terminology, and acquire better listening skills, but will also be able to debate (i.e., speaking skills) on the topic, and write on subtopics that revolve around humans' fight against infectious diseases in real-life. This is worth learning, for, at the end of this unit, students can acquire academic content knowledge enriched with several authentic integrated skills tasks, especially designed for proficiency in the writing and speaking domain. Such an integrated skills approach to their learning will contribute to their understanding, application, evaluation, and critique of real-life cases that occur in today's world.

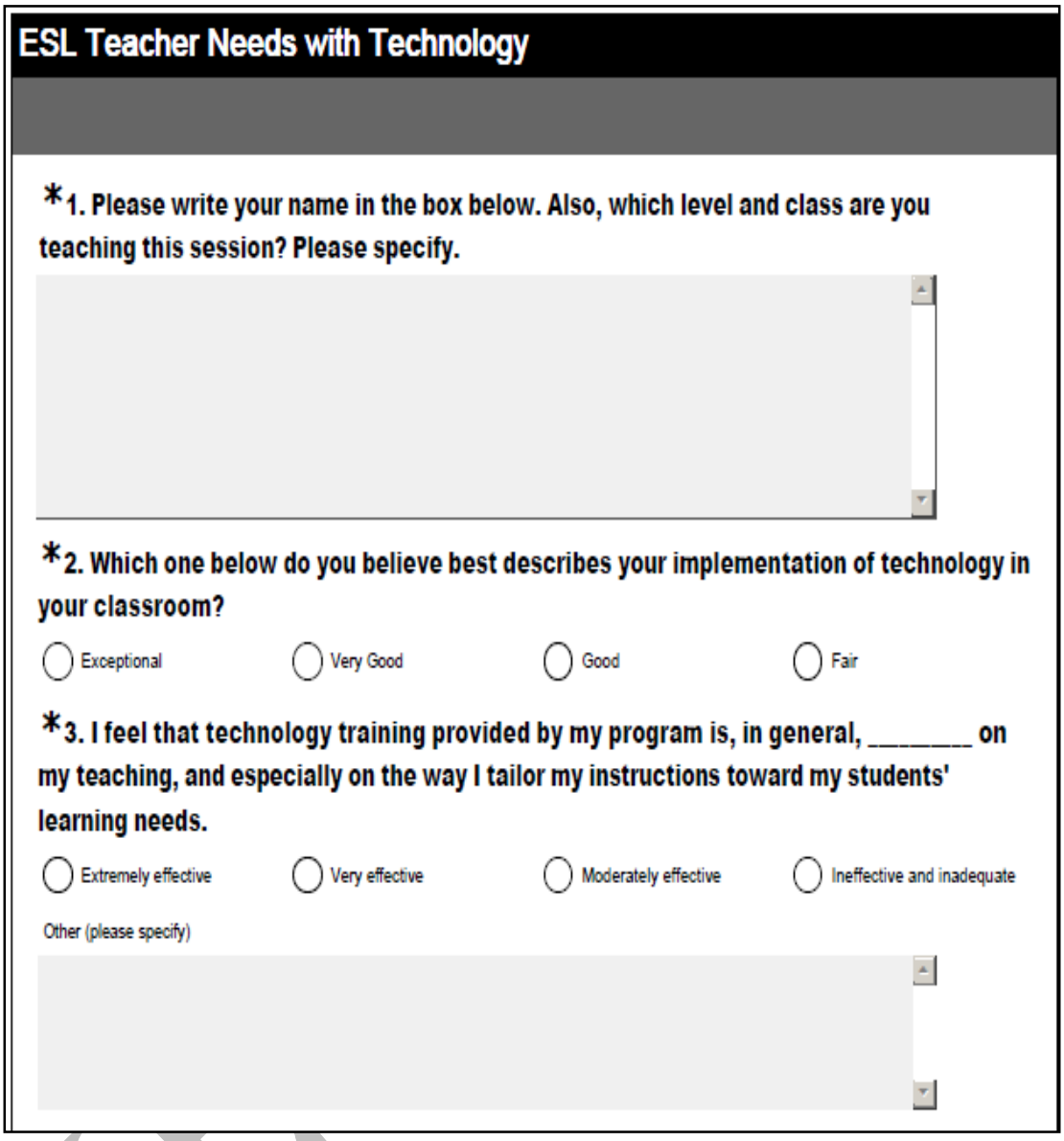
This lesson is also important for adult ESL students to learn, for by use of emerging educational technologies, they can gradually build upon their newly acquired knowledge of all skills in the language English, which is highly congruent with 21st century digital literacies. The course teacher's instructional practices are particularly critical to support the students' knowledge-building process, because she will initially begin to deliver the academic content via scaffolding her students' learning, and as they improve their understanding and practice of the subject matter, she will gradually let them learn the subject matter on their own; a learning/teaching approach that highly aligns with the constructivist learning pedagogy (Vygotsky, 1978). From an ID viewpoint, another note on the importance of teaching this unit lesson to adult ESL students is that the entire life cycle of this CCDT-generated design work will be predominantly guided by the principles of ADDIE.

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Under these particular generative topics, teaching English to speakers of other languages (TESOL) is especially critical—and very timely in the current digital age. Since the English learners in this academic course are adults, appealing to their needs with appropriate technologies, and helping them transform into self-directed learners (Knowles, 1970) could be a real challenge on the part of the instructor. With that in mind, she will deliver the above mentioned generative topics to her learner group with authentic, effective, and engaging (Reiser & Dempsey, 2007) activities supported with a variety of technologies. In order to overcome such potential challenges, and as mentioned earlier, she will base her curriculum on the ADDIE ID framework. Especially the first stage (i.e., analysis) of ADDIE helped the instructor create a *needs analysis survey* (see Figure 5), which she designed with SurveyMonkey. In the conduct of this survey, she collected essential data from her colleagues at school, by sending them an online survey link. This survey simply demonstrated the technology needs of ESL teachers at school. She then designed her weekly syllabi based upon the data she derived from this analysis. The data she collected demonstrated that some of the necessary technology tools are already utilized by teachers both inside and outside of the classroom while some others are not. Thus, the data reported by majority of ESL teachers showed that all teachers needed to be on board as far as their use of cutting-edge technologies in class and in terms of the school administration's attitude toward and encouragement of their use of innovative, digital tools both inside and outside of class. Gagne et al. (2005) contended that instructors need to keep up with the pace of emerging instructional technologies in today's digital world. Taking this into consideration, as she designed this unit lesson, the course instructor began to implement some of the less frequently used and yet popular technologies. With the completion of this academic English course, she will go through all components of CCDT under the TfU framework, and thus further evaluate the extent to which—or how effectively and efficiently—she incorporated these online tools into her teaching this unit lesson. That will be demonstrated under PoUs of this design work.

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Figure 5. Technology Needs Analysis Survey for ESL Teachers



ESL Teacher Needs with Technology

*1. Please write your name in the box below. Also, which level and class are you teaching this session? Please specify.

*2. Which one below do you believe best describes your implementation of technology in your classroom?

Exceptional | Very Good | Good | Fair

*3. I feel that technology training provided by my program is, in general, _____ on my teaching, and especially on the way I tailor my instructions toward my students' learning needs.

Extremely effective | Very effective | Moderately effective | Ineffective and inadequate

Other (please specify)

ESL Teacher Needs with Technology

*4. Dear teacher,

Please choose one or more of the questions below and respond in detail. Your sincere response in this question will immensely affect our decision-making process toward developing a training program solely geared toward your technology needs.

Thank you!

Describe where you see yourself in terms of your in-class technology use. What do you believe your technology needs are, as an instructor? Do you think that your students' learning expectations in your class are fulfilled without a collective use of technologies in class--or outside of the class? Have you ever conversed with students in your class, in need of technology-supported ESL learning? If so, share with us. Do you feel that your students' learning needs can often be met with the current techniques with which you have taught so far? Why/Why not? Do you see yourself as a tech-savvy ESL instructor? If not, why not? Please explain what your needs are with regard to your technology needs in your teaching? What specific software tools would you like to learn about and then practice with your students in your class? Your specific answers in this section will greatly help us provide you with the best technology training possible.



ESL Teacher Needs with Technology

***5. On a typical day of instruction, I make effort to use the computer in my classroom _____:**

- ◯ Everyday of the learning/teaching week
- ◯ Every three days of the learning/teaching week
- ◯ Less than three days of the learning/teaching week
- ◯ Almost never–I really do not need to use it in my class.
- ◯ Additional comments on frequency of your in-class technology use

***6. When I am not teaching, I often use the Internet in order to _____:**

- ☐ collect instructional data or resources for my students
- ☐ retrieve data for my side projects
- ☐ retrieve information that might assist my teaching
- ☐ prepare lesson plans or design curricular materials
- ☐ surf for self-enrichment and extracurricular activities
- ☐ Just for fun

Other (please specify)

***7. As I practice online technologies or other software in my classroom teaching, I feel _____:**

- ◯ extremely comfortable and do not need administrative help or that from other teachers
- ◯ moderately confident and might sometimes need administrative help or that from other teachers
- ◯ slightly confident and often need help from the administrator or from other teachers
- ◯ uncomfortable and always need help from the administrator or from other teachers

Other (please specify)

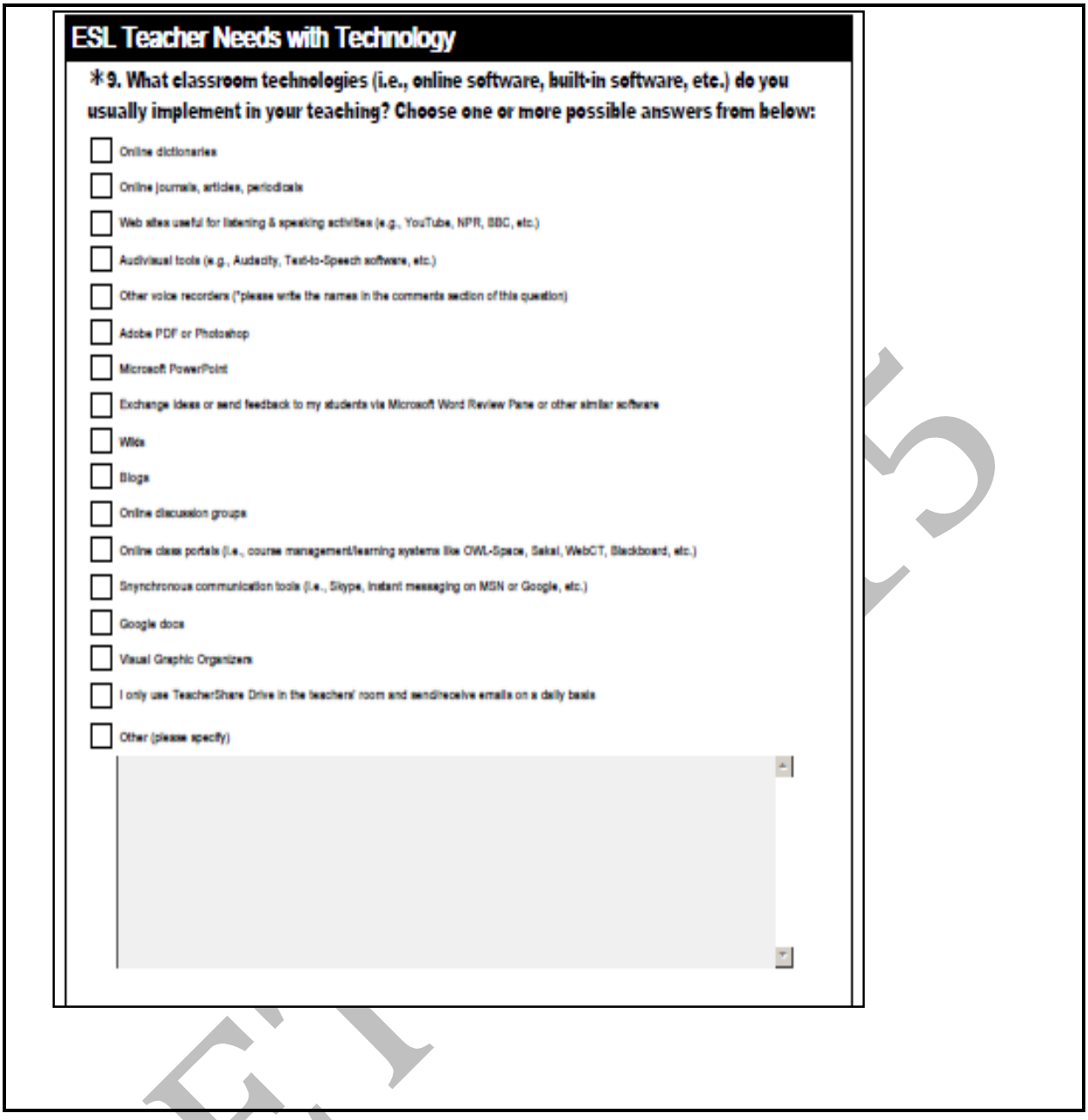
ESL Teacher Needs with Technology

*8. On a 1 to 5 scale, what do you think your students' perceptions are about your technology implementations during both onsite and online teaching, if any?

Ranking: 5=Excellent; 4=Very Good: 3:=Good; 2=Weak; 1=My teacher seems to be totally lost

- ○ 5
- ○ 5-4
- ○ 4
- ○ 4-3
- ○ 3
- ○ 3-2
- ○ 2
- ○ 2-1
- ○ 1

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ESL Teacher Needs with Technology

***9. What classroom technologies (i.e., online software, built-in software, etc.) do you usually implement in your teaching? Choose one or more possible answers from below:**

- [ ] Online dictionaries
- [ ] Online journals, articles, periodicals
- [ ] Web sites useful for listening & speaking activities (e.g., YouTube, NPR, BBC, etc.)
- [ ] Audiviasual tools (e.g., Audacity, Text-to-Speech software, etc.)
- [ ] Other voice recorders (*please write the names in the comments section of this question)
- [ ] Adobe PDF or Photoshop
- [ ] Microsoft PowerPoint
- [ ] Exchange ideas or send feedback to my students via Microsoft Word Review Pane or other similar software
- [ ] Wikis
- [ ] Blogs
- [ ] Online discussion groups
- [ ] Online class portals (i.e., course management/learning systems like OWL-Space, Sakai, WebCT, Blackboard, etc.)
- [ ] Snynchronous communication tools (i.e., Skype, instant messaging on MSN or Google, etc.)
- [ ] Google docs
- [ ] Visual Graphic Organizers
- [ ] I only use TeacherShare Drive in the teachers' room and send/receive emails on a daily basis
- [ ] Other (please specify)

IE

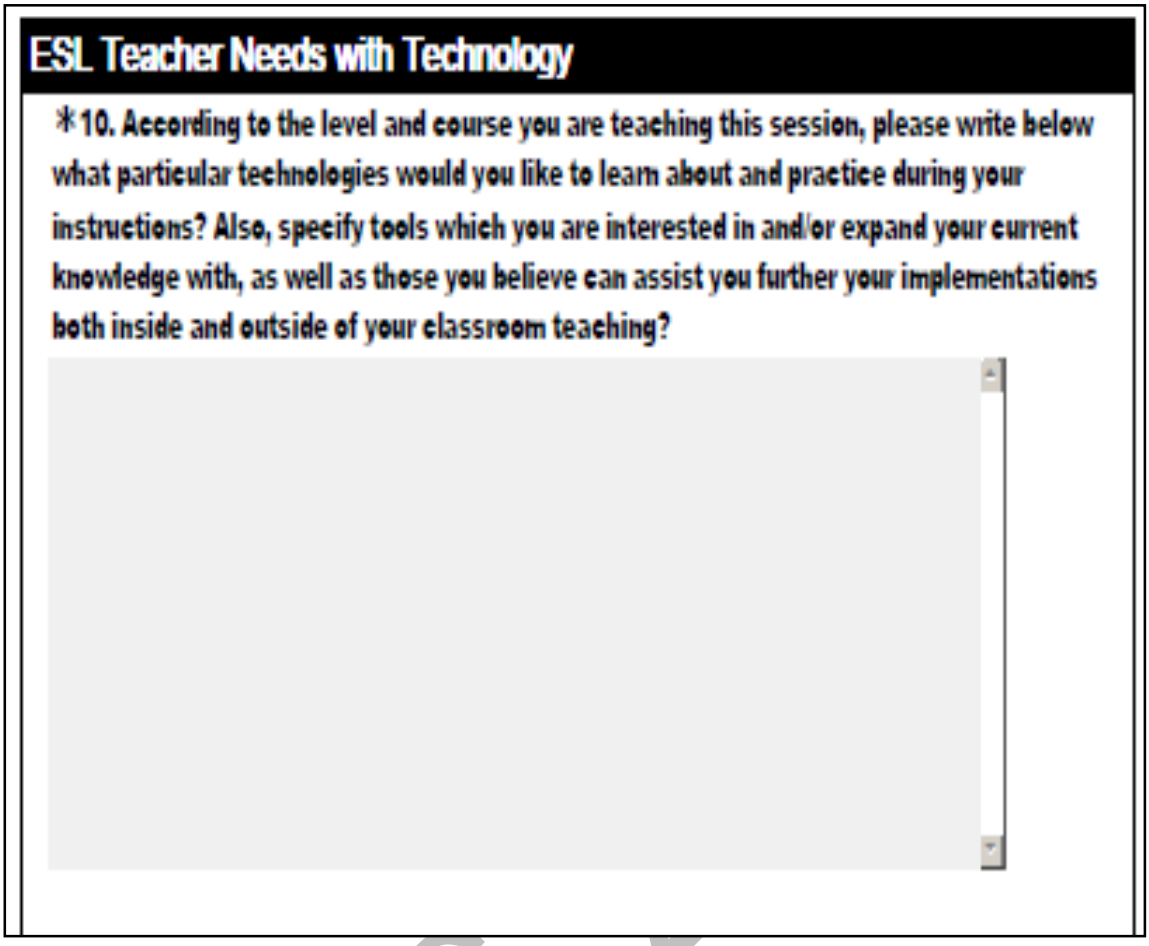


Figure 5. This is an online survey designed with SurveyMonkey sent to ESL teachers in order to decipher their needs with educational technologies to be used both inside and outside of their classrooms. Survey URL: https://www.surveymonkey.com/s/J9JSBGP

UNIT LEVEL UNDERSTANDING GOALS (UGs)

UG1: KNOWLEDGE GOALS

Based on the generative topic of this unit, How to Avert the Spread of Infectious Diseases, the students will develop an understanding of the war-related academic vocabulary.

The first learning goal in this unit (i.e., Microbiology) is to ensure that advanced level ESL students extensively understand and acquire the sophisticated vocabulary words, concepts, expressions, and all of the technical terminology necessary to apply in real-life cases. Knowledge goals align with one of Benjamin Bloom's (1968) educational objectives under the following cognitive domain: knowledge. With knowledge goals, the ESL students in this course will transform into self-driven, intrinsically-motivated learners, which will ultimately

affect their achievement levels during our educational activities. Students' metacognitive knowledge about what they know, or self-efficacy with which they can develop about their own learning (Ormrod, 2008) will lead them to extrapolation of what context-based readings, lectures, oral and written expressions, concepts and expressions will mean to them. The students will eventually gain mastery in deriving and constructing their own meanings from within the related texts and terms. By performing integrated tasks on the online course, AC4 online, students will better develop their acquisition of four skills in English, by focusing on humans' combat with contagious diseases in real-life settings.

Ug2: Processes

After a list of Microbiology-related vocabulary words is handed out to the students, those consistent with the reading and listening excerpts (see Figure 6) built both in the text book, Academic Connections 4 (AC4) and also in its interactive, online course (AC4 Online) will be covered. Next, topic-related passages will be read, and vignettes with their transcripts will be audibly presented to them. Throughout this process, the students will be asked to review this vocabulary list, so their vocabulary skills can assessed with a quick vocabulary test. Students are then to internalize some of the technical words necessary for them to be able to write a 5-paragraph process essay about the topic, which will be their culminating writing project as the topic is concluded. The topic title of this take-home writing assignment will be as follows: *How to Avoid the Spread of Infectious Diseases*. Meanwhile, the students will be additionally assigned to complete take-home, online listening quizzes, which they can take via the AC4 online, interactive course.

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Figure 6. A Listening Activity from the Online Lab

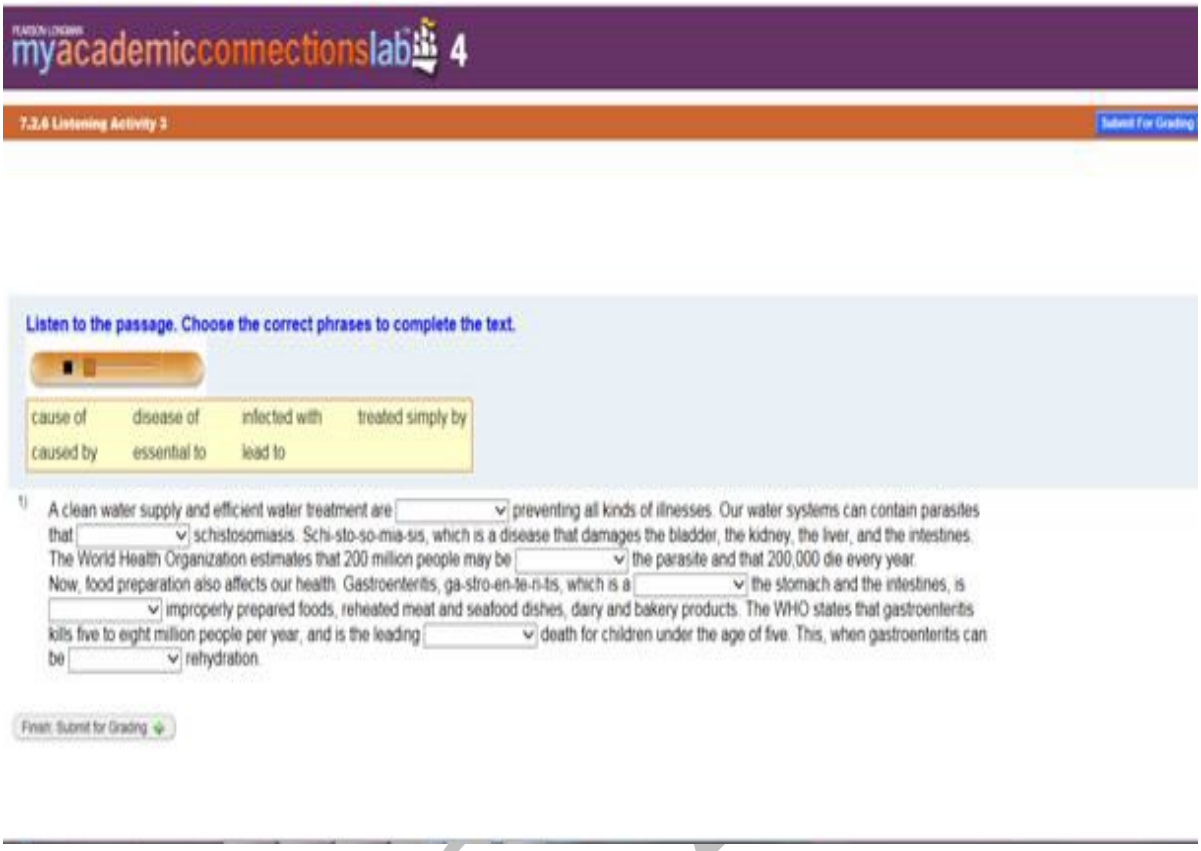


Figure 6. This is an online, interactive listening activity from the online lab (i.e., AC4 online), which assists with assessing ESL students' understanding of the content of Unit 7 (i.e., Microbiology).

Ug3: Methods Goals

ESL students will understand the purpose and implementation of all of the aforementioned educational technology tools commonly used for exploration, comprehension, demonstration, knowledge, acquisition, application, analysis, synthesis with alternative solutions, and evaluation (Bloom, 1968). With online, interactive tests on AC4 site (see Figure 7 for an exemplary reading activity), the students will especially appreciate the similarities and differences between specific Microbiology-related terms and/or expressions, such as between infection and contagion, or among vulnerable to, resistant to, susceptible to, sensitive to, symptom, syndrome, attack, battle against, be overcome, combat, fight, epidemic, pandemic, etc.

Figure 7. A Reading Activity from the Online Lab

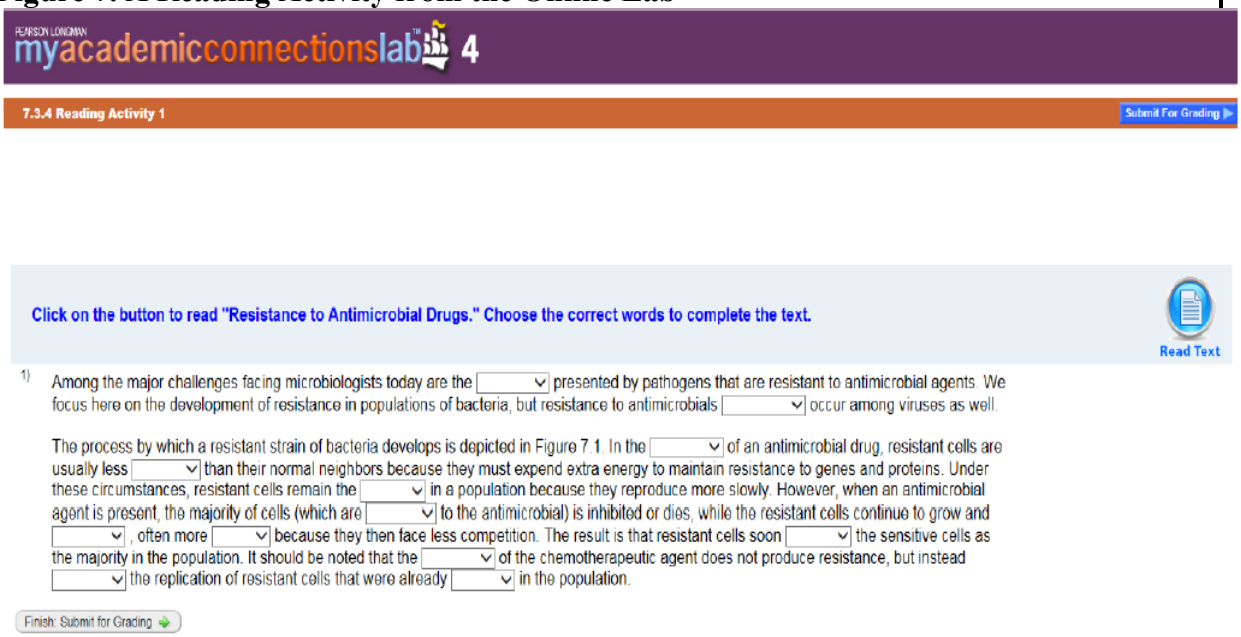


Figure 7. The aim with this online, interactive reading activity is to support ESL students' thorough understanding of the topic, *Resistance to Antimicrobial Drugs*.

Ug4: Purpose Goals

Students will come to understand the reason why utilizing a variety of technologies both inside and outside of the classroom will substantially contribute to their comprehension, application, analyses, syntheses, and evaluation in the process of gaining mastery in all four fundamental skills (i.e., listening, speaking, reading, and writing) (Gagne et al., 2005). They will also realize to what extent technology supports them with directing their own learning and constructing their own meanings both individually with their peers together in the classroom. According to Reiser and Dempsey (2007), it is essential that effective instructors/trainers design instruction/training programs with which their learners/trainees can first identify and analyze the learning goals/objectives of the given content, with the purpose of understanding first their own learning needs and next the objectives of the instructional practices to be given. Gustafson and Branch (1997) pointed out that all ID approaches determine a learning objective, which is a very necessary component of the design process. Learners can then understand the particular content, only to prepare themselves toward integrating and applying their newly acquired knowledge into their current academic—or business-related—practices. Understanding the purpose of instruction is congruent with the major ID model of this unit curriculum design, ADDIE (Reiser & Dempsey, 2007).

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Ug5: Forms Goals

This unit curriculum design is empowered by the ADDIE (i.e., Analysis, Design, Development, Implementation, Evaluation) ID model (see Figure 8, retrieved from Gagne et al., 2005, p. 13), whose strength is being iterative and self-corrective.

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Figure 8. ADDIE, a Highly Popular ID Model (Retrieved from Gagne et al., 2005, p. 13)

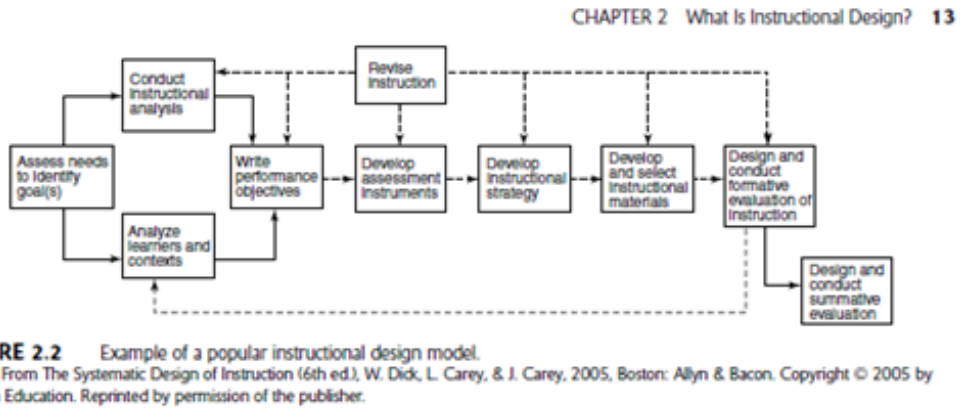


Figure 8. The chart above demonstrates a highly popular ID model in the process of designing, delivering, executing, and evaluating effective instruction. Drawing on the nature of ADDIE, the content of this unit design will be continuously modified and developed, which cannot be possible without the ESL students' corrective feedback at the end of the course (see section entitled *Performances of Understanding* of this design). Given that there is a specific problem and learning need (Gagne et al., 2005) that is to be addressed and rectified, which is that adult ESL students need to master their learning in all skills in English with support of CMI, this particular unit curriculum design was created with the expectation that it can address this issue.

The design involves a highly sophisticated academic vocabulary repertoire for adult ESL students, who fall under a certain age group and educational level. Within this age range and educational level, the students study English as they prepare to go to undergraduate or graduate schools in the U.S. As such, designing this unit consistent with the principles of instruction under the ADDIE model and constructivist learning framework was the primary goal, which can greatly assist with the students' learning for understanding. Such a learning goal can lead one to deeply comprehend and appreciate the epistemological, philosophical, and pedagogical underpinnings of the design.

From an academic viewpoint, with this unit design, students will understand how to use each online module in the AC4 online Lab in order to take various integrated skills tasks such as in writing and speaking, and to master their performances on what they have learnt about the topic, Microbiology throughout the course. Gagne et al. (2005) pointed out that "the idea of mastery requires a change in thinking about instructional design as well as assessment"

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(Bloom, 1968, as cited in Gagne et al., 2005, p. 274). AC4 Online course is a proper mode and rate of instruction in this adult ESL course as far as all of the understanding goals are concerned, because of two reasons:

1. AC4 Online Lab will not only help ESL students master their own learning throughout the course, but also lead them to get more hands-on with it than ever before; **2.** The instructor of this course can more conveniently engage in further instructional practices each time she provides her students with feedback on their academic performances. Also, she can practice further assessments and evaluations—and for her program—which, in turn, can explain the degree to which AC4 online is a very powerful mode of CMI. The impact of AC4 online courseware can be felt both by the instructor and students of this course, especially when the ADDIE ID principles are taken into account (Reiser & Dempsey, 2007).

PERFORMANCES OF UNDERSTANDING (Pous): CULMINATING PERFORMANCES VIA AC4 ONLINE LAB TOWARD UNDERSTANDING AND APPLICATION OF WAR-RELATED VOCABULARY

Over the course of six weeks, ESL students will understand and apply different meanings of war-related vocabulary in the Microbiology unit, wherein they will learn about how they can fight diseases that are infectious. The students will also culminate their performances, by giving an individual 5-minute impromptu speech in class or a 15-minute group-based oral report which they are to prepare at home, so they can showcase in class at the end of the unit. The learning goal with such impromptu speaking assignments is to help the students demonstrate their comprehensive understanding of the topic. As they showcase their culminating performances both during the semester and at the end of the course, students can go to YouTube and make their own videos by storytelling/narrating. They can also produce movies by using iMovie or other related movie making software. They can additionally design word clouds through tools such as Wordle.net. Furthermore, the students can create blogs and wikis where they can upload several materials regarding Microbiology-related expressions and then demonstrate them in class. They can also build mind/concept maps with

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a mind mapping tool such as Inspiration.com, while using online synonmys and antonyms dictionaries such as Visual Thesaurus.com or dictionaries such as just-the-word.com (JTW), or wordandphrase.info/frequencyList.asp. For showcasing the root words and prefixes of academic vocabulary they will learn until the end of this six-week course, they can additionally refer to learnthat.org and several such other web sites.

There are additional technologies by which ESL students in this course can perform their learning, such as PPT (Microsoft Office), Prezi.com (via web), Google Drive, Google Chat, WordPress.Org (for Blogs), Wetpaint,com (for Wikis), Skype, Face Time, LINE, and various other applications for voice and video calls. The fact that the students can find the opportunity to create their own designs, vocabulary lists, slides, wikis, and blogs both audibly and visually will help them excel at their learning at the end of the unit (i.e., Microbiology). These PoUs will be engaging, interactive, and fun for all students. Mastery learning (Gagne et al., 2005) with such creative and original PoUs will prove to have an effective, efficient, appealing (Reiser & Dempsey, 2007), ingenious, and authentic impact on instruction not only tailored toward this particular group of adult ESL learners, but also for further groups in future instructional practices, as well. Based on the principles of ADDIE, AC4 Online lab and such innovative technologies can help the students achieve both content and skills-based mastery. Reiser and Dempsey (2007) pointed out under the guidelines of ADDIE that searching for proper modes and rates of instruction with which mastery learning can be achieved is what effective instructors and trainers should do. With that in mind, this instructional design should yield effective instruction and considerably assist with all students' performances.

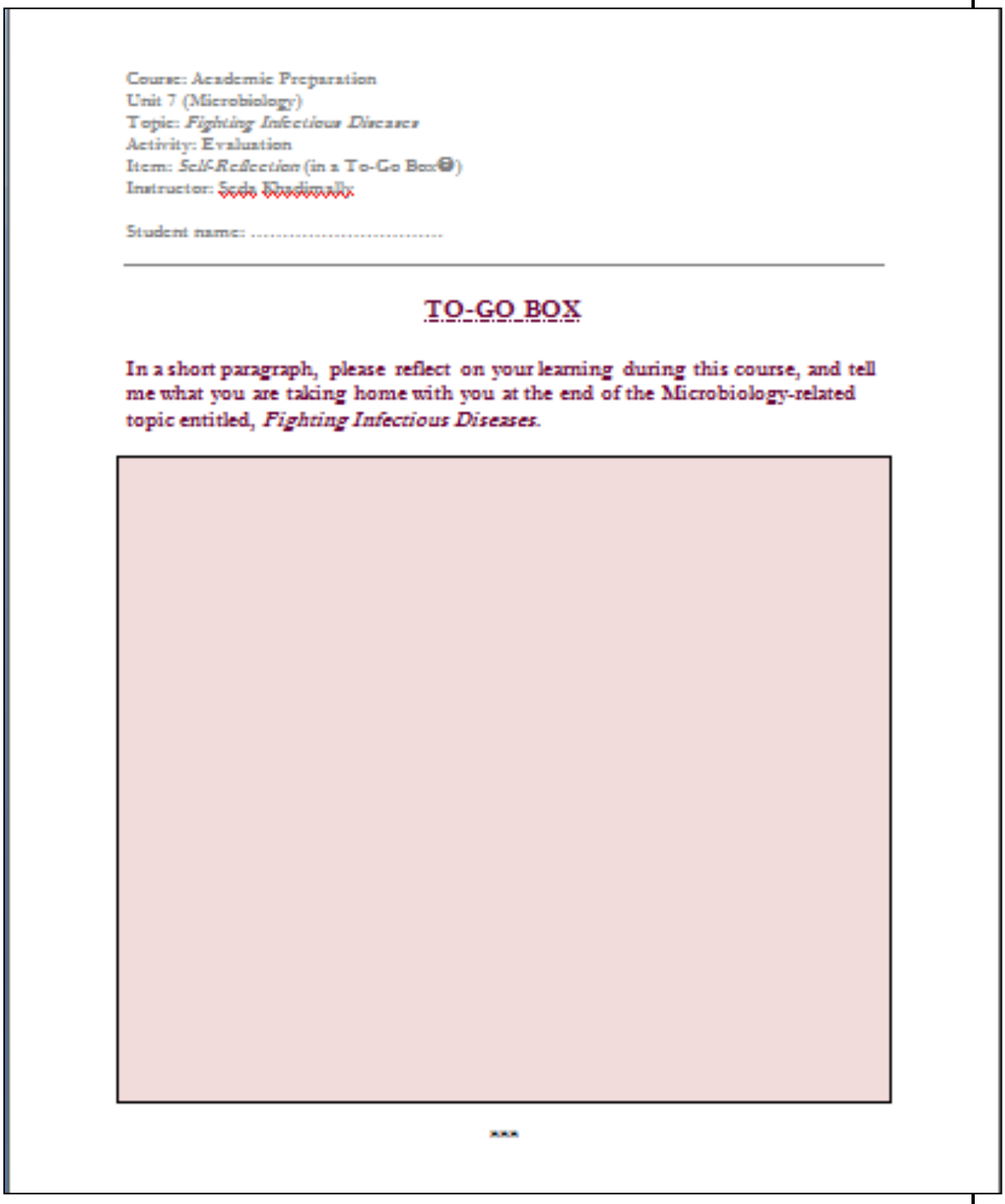
At the end of each showcase, each of the students will be provided with individual—and corrective—feedback both in one-on-one settings and in groups. Reiser and Dempsey (2007) emphasized the vitality of providing corrective feedback to learners, instead of one given in a right or wrong format. Next, following round-table discussions and team-related activities, all students will find the opportunity to evaluate both their own performances (see Figure 9) and those of their classmates' with *self-reflection and peer-assessment sheets* (see Figures 10.1 & 10.2). Engaging in self-reflection will be highly beneficial to adults ESL students' cognitive development, for it will substantially help raise their self-efficacy and motivational levels, along with their improved learning beginning in this specific level (i.e., Level 6). Also, this type of reflection will be a vehicle for personalized information, demonstrating each student's

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subjective and sincere opinions both about their peers' and their own. Such data could not be possibly collected through faculty-to-student feedback. Therefore, reliable and valid information collected in the evaluation stage by use of multiple sources is an instructional objective for the ESL teacher instructing this course, a goal which is also consistent with the *evaluation* component of the ADDIE ID model.

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Figure 9. Self-Reflection Sheet



Course: Academic Preparation
Unit 7 (Microbiology)
Topic: *Fighting Infectious Diseases*
Activity: Evaluation
Item: *Self-Reflection* (in a To-Go Box®)
Instructor: Sedo Khadimally

Student name: .....

TO-GO BOX

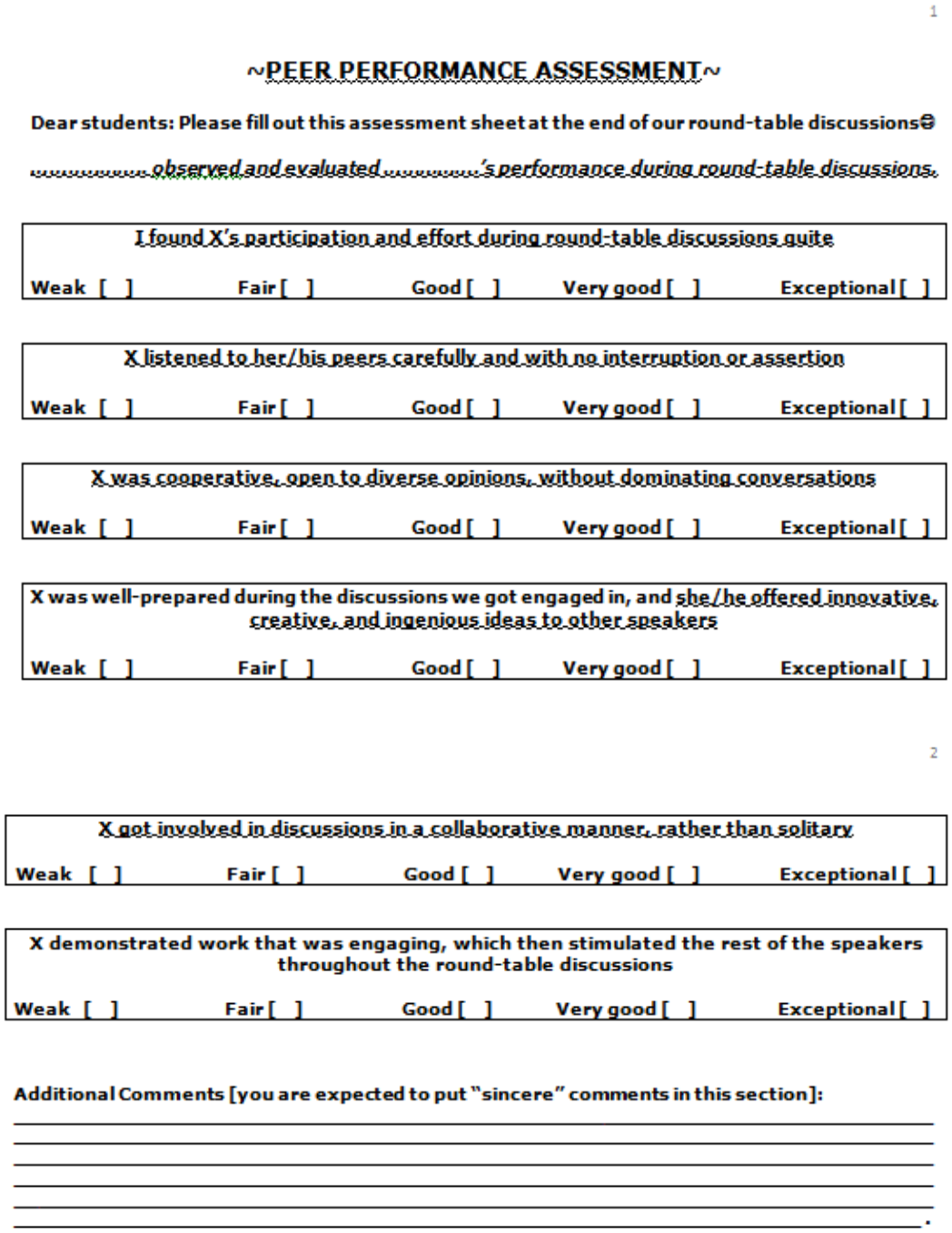
In a short paragraph, please reflect on your learning during this course, and tell me what you are taking home with you at the end of the Microbiology-related topic entitled, *Fighting Infectious Diseases*.

***

Figure 9. At the end of this academic preparation course, by using this self-reflection sheet, all adult ESL students will be asked to reflect on their learning from the pertinent unit, *Microbiology*, and the topic entitled, *Fighting Infectious Diseases*.

F

Figure 10.1. Peer Performance Assessment Sheet



1

~PEER PERFORMANCE ASSESSMENT~

Dear students: Please fill out this assessment sheet at the end of our round-table discussions.

.....observed and evaluated.....'s performance during round-table discussions.

I found X's participation and effort during round-table discussions quite				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

X listened to her/his peers carefully and with no interruption or assertion				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

X was cooperative, open to diverse opinions, without dominating conversations				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

X was well-prepared during the discussions we got engaged in, and she/he offered innovative, creative, and ingenious ideas to other speakers				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

2

X got involved in discussions in a collaborative manner, rather than solitary				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

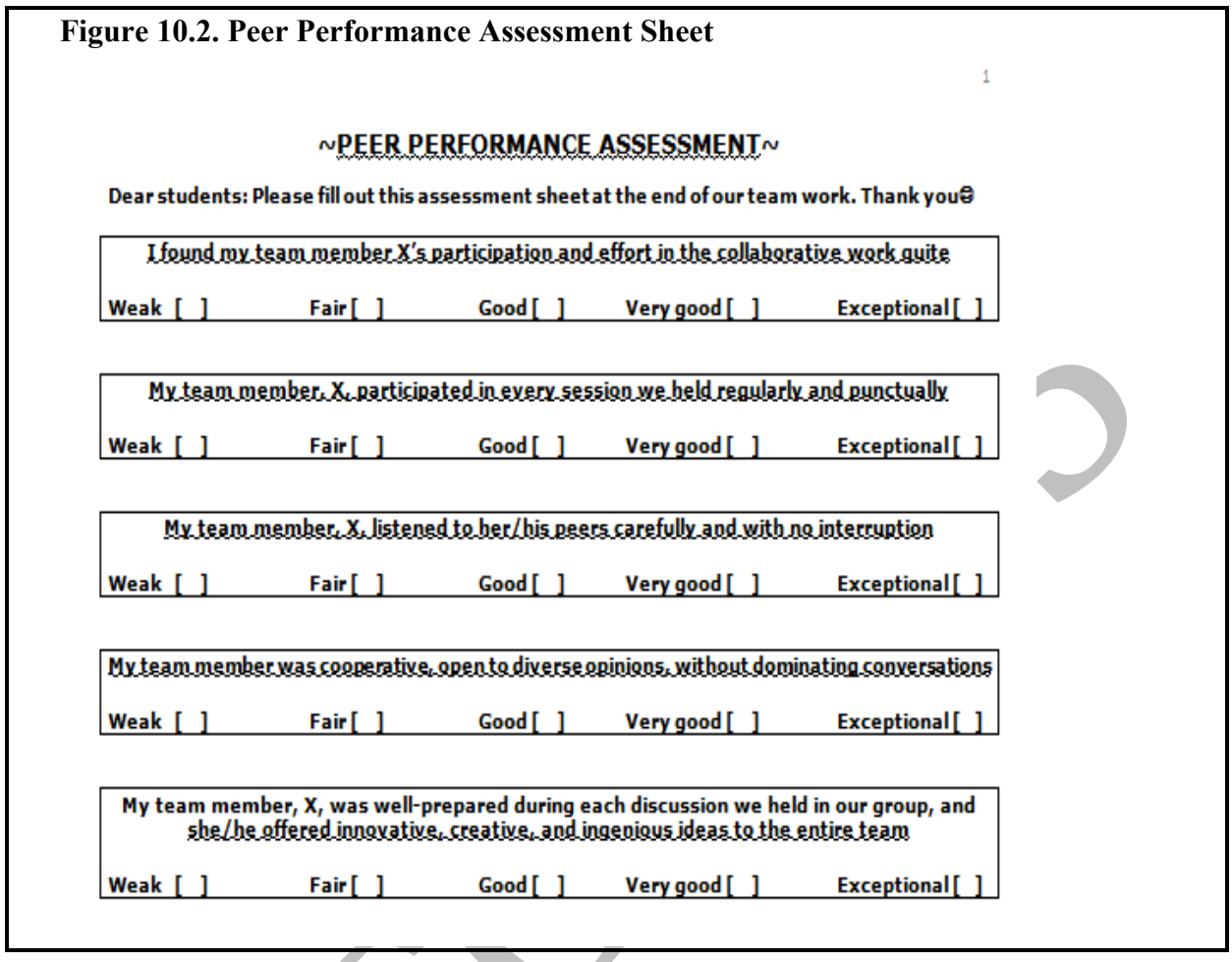
X demonstrated work that was engaging, which then stimulated the rest of the speakers throughout the round-table discussions				
Weak [ ]	Fair [ ]	Good [ ]	Very good [ ]	Exceptional [ ]

Additional Comments [you are expected to put "sincere" comments in this section]:

_____
_____
_____
_____
_____
_____.

Figure 10.1. ESL students will be asked to evaluate their peers' performances based on their observations during round-table discussions on the following topic, *How to Avert the Spread of Infectious Diseases*.

Figure 10.2. Peer Performance Assessment Sheet



1

~PEER PERFORMANCE ASSESSMENT~

Dear students: Please fill out this assessment sheet at the end of our team work. Thank you☺

I found my team member X's participation and effort in the collaborative work quite

Weak [ ] Fair [ ] Good [ ] Very good [ ] Exceptional [ ]

My team member, X, participated in every session we held regularly and punctually

Weak [ ] Fair [ ] Good [ ] Very good [ ] Exceptional [ ]

My team member, X, listened to her/his peers carefully and with no interruption

Weak [ ] Fair [ ] Good [ ] Very good [ ] Exceptional [ ]

My team member was cooperative, open to diverse opinions, without dominating conversations

Weak [ ] Fair [ ] Good [ ] Very good [ ] Exceptional [ ]

My team member, X, was well-prepared during each discussion we held in our group, and she/he offered innovative, creative, and ingenious ideas to the entire team

Weak [ ] Fair [ ] Good [ ] Very good [ ] Exceptional [ ]

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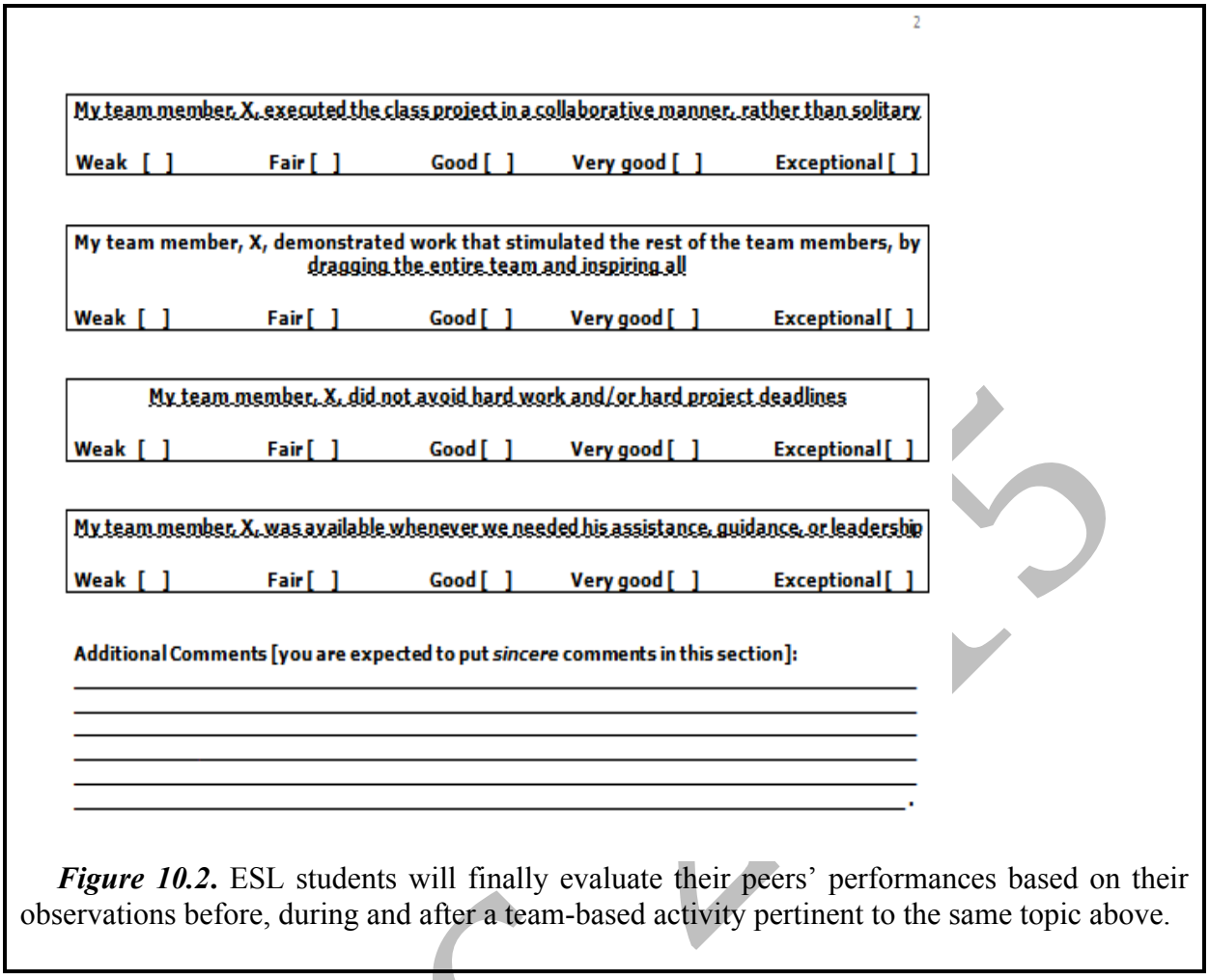


Figure 10.2. ESL students will finally evaluate their peers' performances based on their observations before, during and after a team-based activity pertinent to the same topic above.

Finally, the ESL instructor will also hand out to her students an instructor/course evaluation sheet with which they can evaluate her instructional skills. As she receives feedback from these evaluations, she will be able to take corrective actions and hone her instructional methods, or capitalize on her best practices.

By using the modular, online component (AC4) of the textbook, she will work with innovative modules in order to improve each skill. As their instructor and the moderator of the AC4 online lab, she will facilitate the learning environment for her adult ESL students in conducive to their autonomous, mastery learning in each skill. She can additionally promote a learning and teaching environment congruent with higher-order complex cognitive skills (van Merriënboer, 1997) as in the following:

A. Vocabulary + CMI + via associations: cognitive learning;

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B. Listening + CMI + note-taking techniques + group work on listening comprehension questions + pair/group discussions: cognitive learning;

C. Reading + CMI + text analyses (individual and group work) + group discussions on texts: cognitive learning;

D. Speaking in real-life settings + CMI + collaborative tasks + pair/group discussions : experiential learning;

E. Writing + CMI + analytical writing + argumentation + critique: experiential learning.

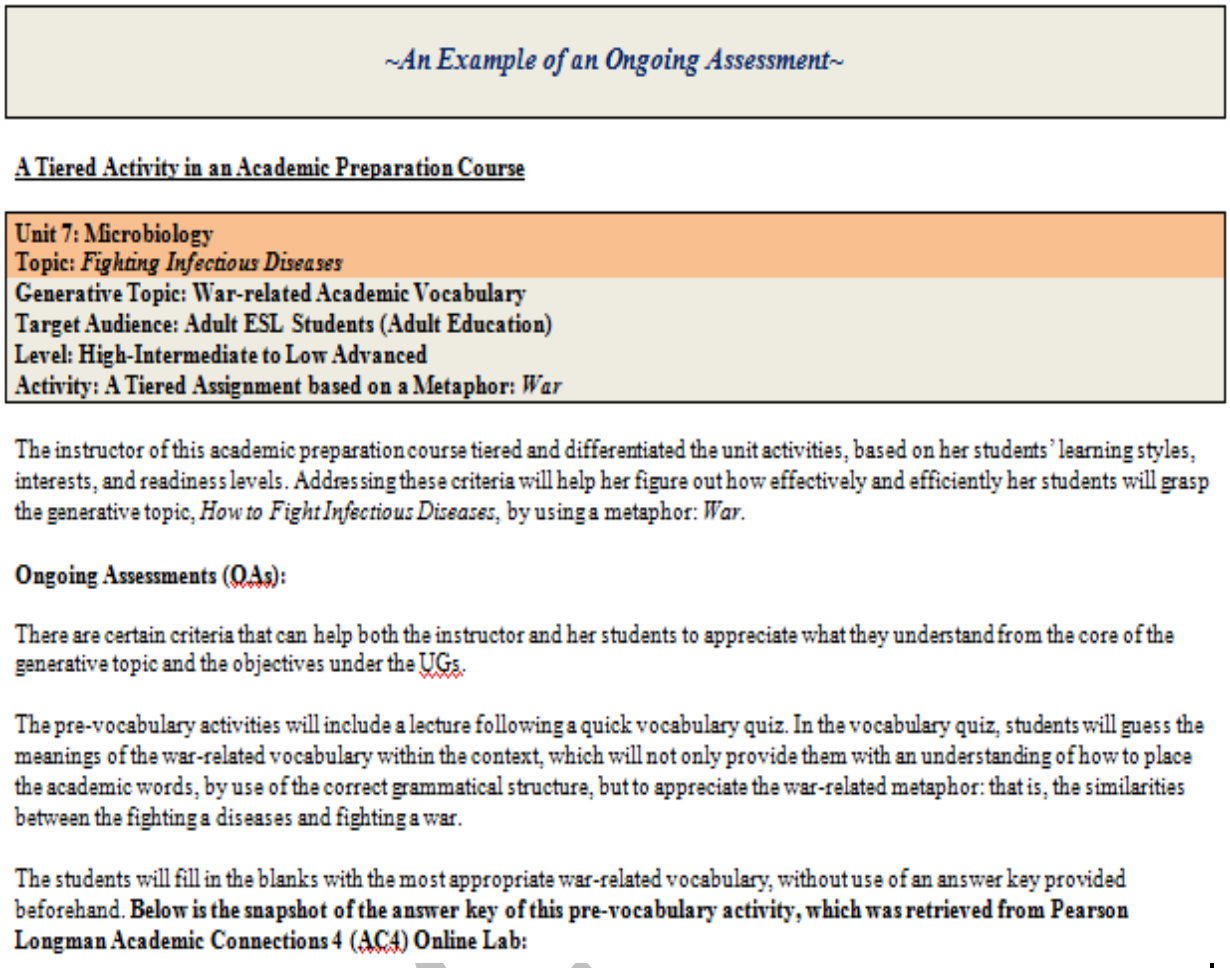
In terms of the nature of this instructional design, fostering all adult ESL learners' complex cognitive skills will be important as they excel at transferring their knowledge of unit content under the principles of first instruction (Reiser & Dempsey, 2007). Epistemologically, it is also a breeding ground for socially constructed knowledge in class based on the constructivist learning approach (Reiser & Dempsey, 2007).

ONGOING ASSESSMENTS (Oas): TIERED ACTIVIES VIA AC4 ONLINE COURSE

There are certain criteria that will help both the instructor and her students understand to appreciate what they understand from the core of the generative topic and the objectives under the UGs. Pre-vocabulary activities will include a quick vocabulary quiz and then a lecture, respectively. In the vocabulary quiz, the students will make educated guess about the meanings of the war-related vocabulary within the context, which will not only provide them with an understanding of how to appropriately place certain academic words—by use of the correct grammatical structure—but appreciate the war-related metaphor: that is, the similarities between the fighting a diseases and fighting a war. The students will fill in the blanks with the most appropriate war-related vocabulary. The answer key will not be handed out to them beforehand. Below is an example of an ongoing assessment in this academic preparation course (see Figure 11).

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Figure 11. An Example of an Ongoing Assessment with Tiered Activities



~An Example of an Ongoing Assessment~

A Tiered Activity in an Academic Preparation Course

Unit 7: Microbiology
Topic: *Fighting Infectious Diseases*
Generative Topic: War-related Academic Vocabulary
Target Audience: Adult ESL Students (Adult Education)
Level: High-Intermediate to Low Advanced
Activity: A Tiered Assignment based on a Metaphor: *War*

The instructor of this academic preparation course tiered and differentiated the unit activities, based on her students' learning styles, interests, and readiness levels. Addressing these criteria will help her figure out how effectively and efficiently her students will grasp the generative topic, *How to Fight Infectious Diseases*, by using a metaphor: *War*.

Ongoing Assessments (OAs):

There are certain criteria that can help both the instructor and her students to appreciate what they understand from the core of the generative topic and the objectives under the UGs.

The pre-vocabulary activities will include a lecture following a quick vocabulary quiz. In the vocabulary quiz, students will guess the meanings of the war-related vocabulary within the context, which will not only provide them with an understanding of how to place the academic words, by use of the correct grammatical structure, but to appreciate the war-related metaphor: that is, the similarities between the fighting a diseases and fighting a war.

The students will fill in the blanks with the most appropriate war-related vocabulary, without use of an answer key provided beforehand. **Below is the snapshot of the answer key of this pre-vocabulary activity, which was retrieved from Pearson Longman Academic Connections 4 (AC4) Online Lab:**

Figure 11. With this formative, ongoing assessment, the ESL teacher will hold an integrated skills approach. By use of the tiered activities she prepared in this assessment, she will be able to figure out the extent to which her students will acquire an understanding of the generative topic, *Fighting Infectious Diseases*, and gradually build upon their newly gained knowledge.

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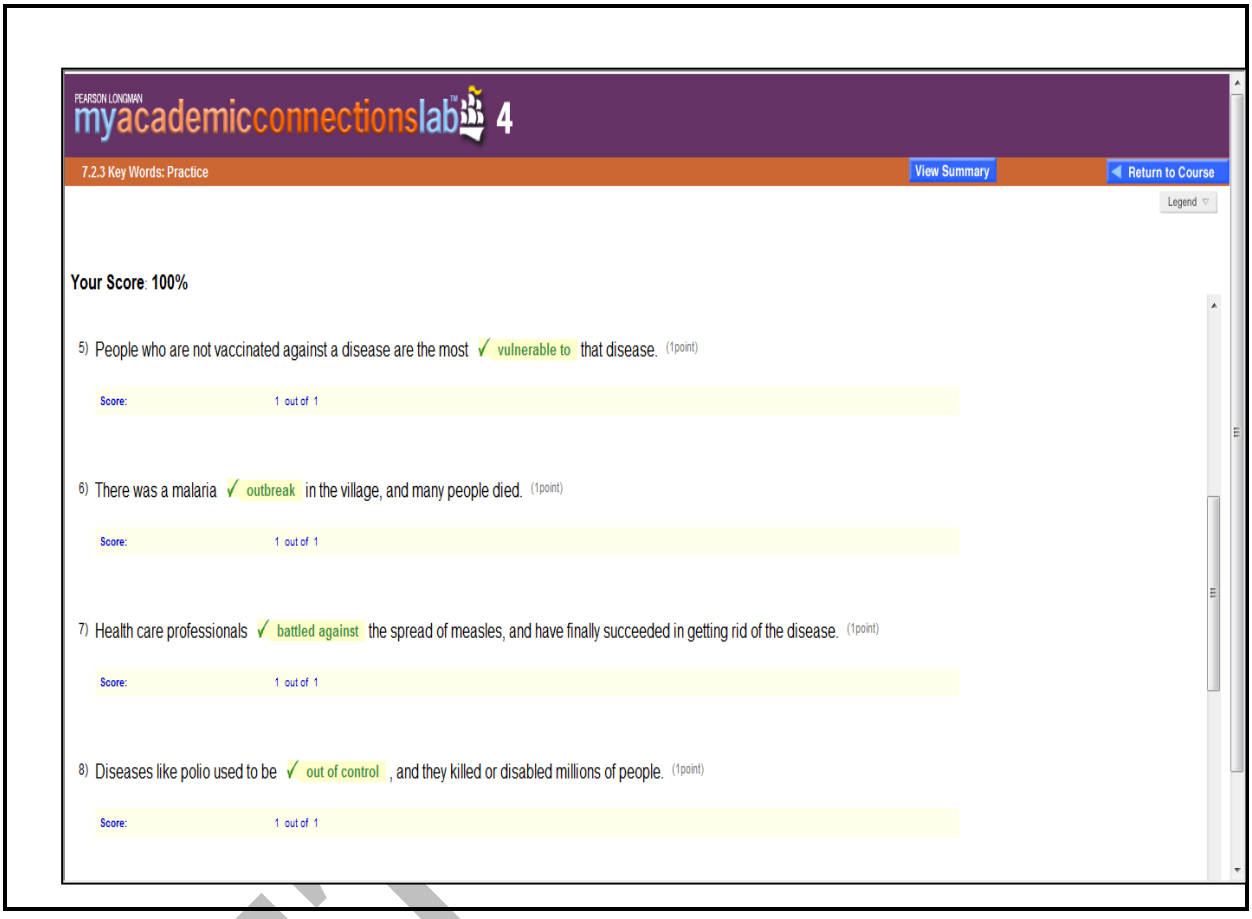
Activity 1: Gap-Filling

Fill in the blanks below (see Figure 12), by guessing the war-related vocabulary from within the context, before we get to read the passage and listen to the lecture. For this activity, I am asking you to work with a partner of your choice. I suggest you use your previous experiences about infectious diseases and how you fought them in the past. You should consult your partner to figure out the most appropriate battle-related words in each question

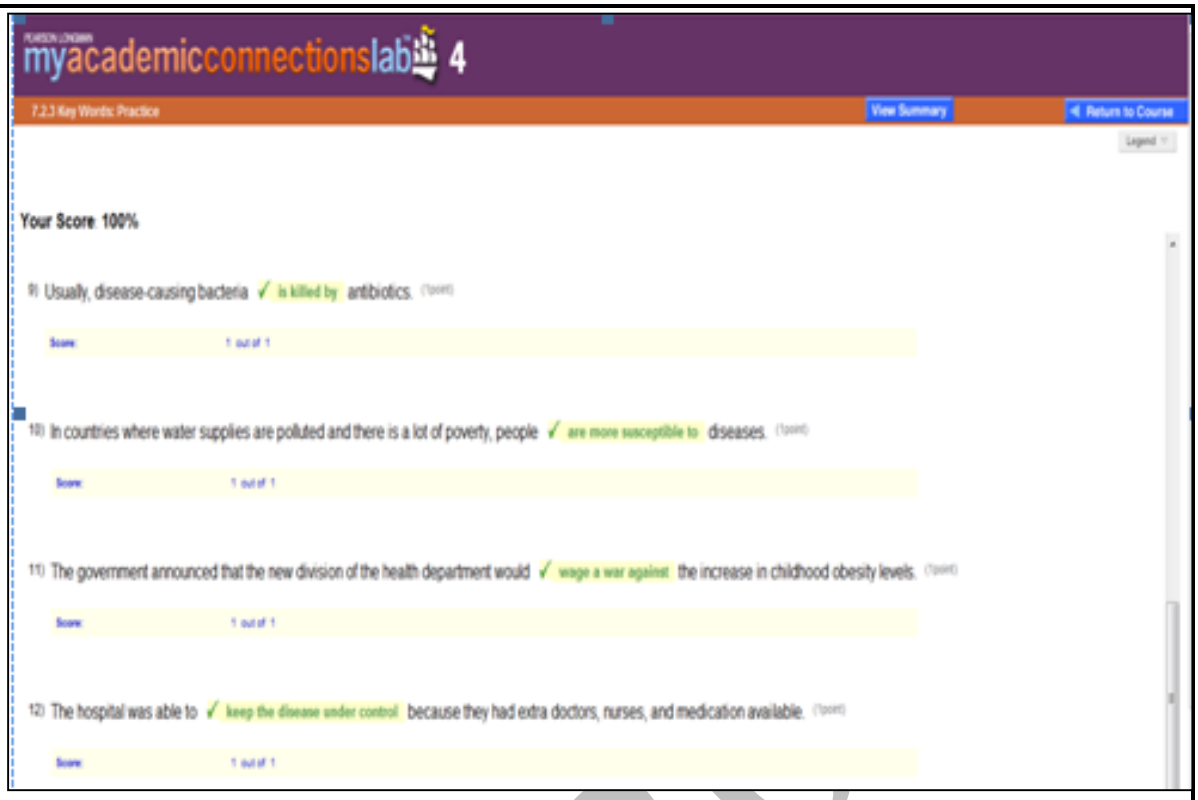
(see the demonstration on Prezi via http://prezi.com/fgcxhttzyndn/?utm_campaign=share&utm_medium=copy&rc=ex0share).

Figure 12. Activity 1: Gap-Filling




PEARSON LONGMAN
myacademicconnectionslab 4
7.2.3 Key Words: Practice
View Summary
Return to Course
Legend
Your Score: 100%
5) People who are not vaccinated against a disease are the most ✓ vulnerable to that disease. (1point)
Score: 1 out of 1
6) There was a malaria ✓ outbreak in the village, and many people died. (1point)
Score: 1 out of 1
7) Health care professionals ✓ battled against the spread of measles, and have finally succeeded in getting rid of the disease. (1point)
Score: 1 out of 1
8) Diseases like polio used to be ✓ out of control , and they killed or disabled millions of people. (1point)
Score: 1 out of 1

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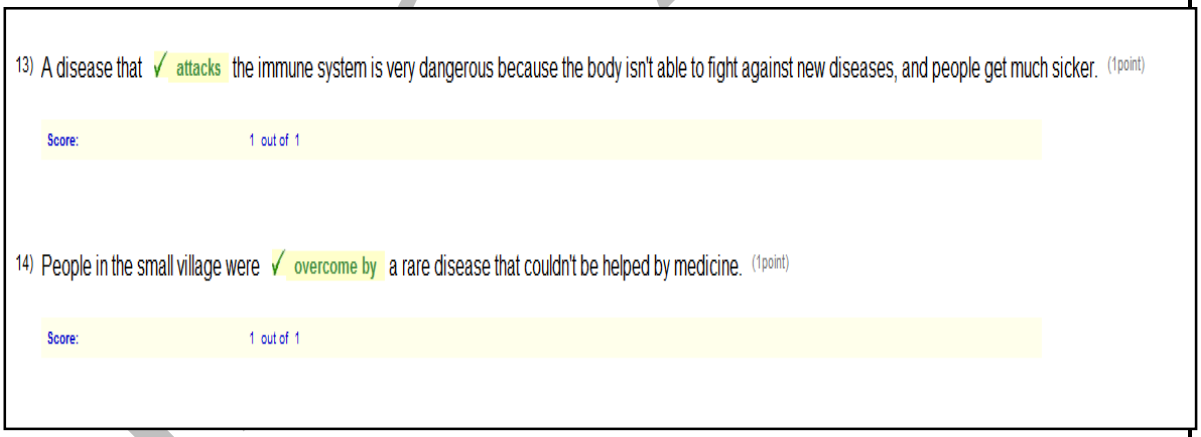


Figure 12. With his gap-filling vocabulary activity from AC4 online lab, adult ESL students are asked to pair up and guess various war-related vocabulary words regarding the context (i.e., humans' fight with infectious diseases). The students are then to fill in the blanks with these words. This is a useful warm-up activity for students prior to their passing onto subsequent activities in other skills such as reading and listening. The scaffolding component in this activity can especially lead to an understanding that the course instructor applies a constructivist learning approach.

Activity 2: Investigative Question

Look at the picture below. What do you see in this picture?

Figure 13. Picture of a Baby Vaccinated in the Fight with Infectious Diseases

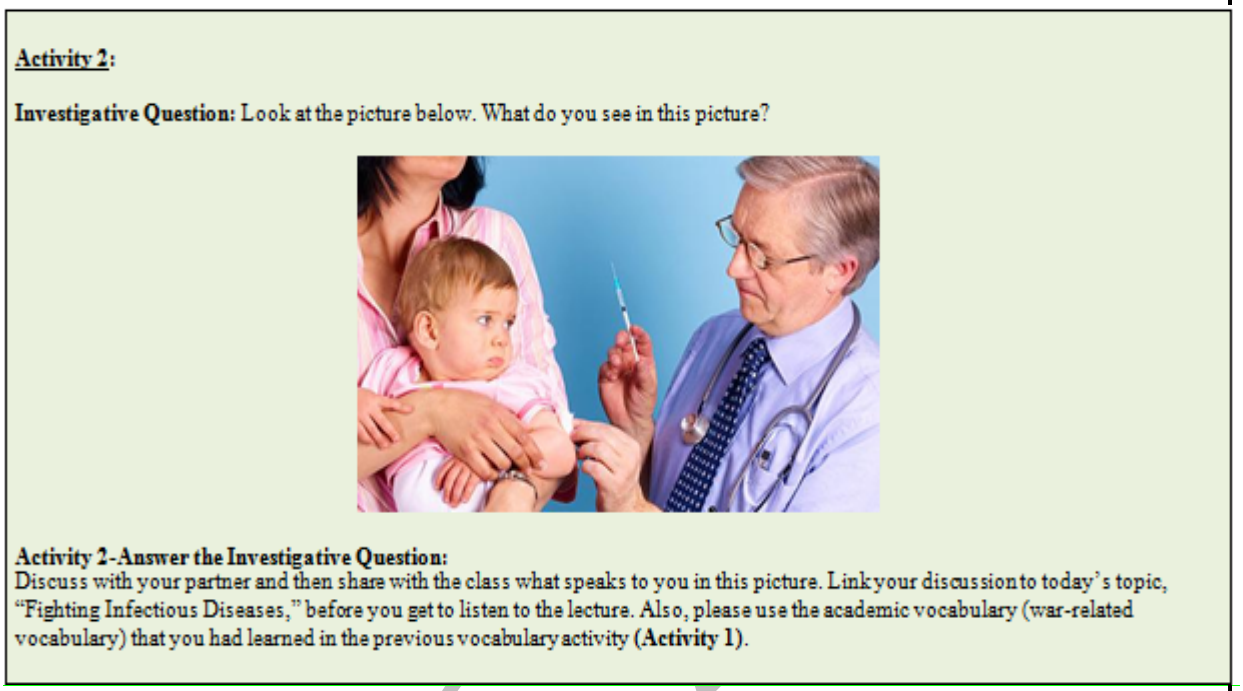


Figure 13. This visual is used in class as a warm-up activity for discussion among ESL students.

Source: https://prezi.com/fgcxhttzyndn/copy-of-copy-of-technology-making-learning-meaningful/

Activity 3: Listening

Now, go to your online course (AC4), and login with your user ID and password in order to listen to the lecture, *Conditions that Affect the Spread of Infectious Diseases* (see Figure 14). What did you understand while listening to the professor's lecture? You could read the transcript of this lecture on Prezi from

http://prezi.com/fgcxhttzyndn/?utm_campaign=share&utm_medium=copy&rc=ex0share).

Answer The Investigative Question

Based on your comprehension of the lecture, discuss with your partner how we can avert the spread of resistant bacteria or the spread of infectious diseases. Should you have any

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confusion while listening to the lecture, check the back of your textbook to also read the audioscript of this lecture.

Figure 14. Unit 7 (Microbiology) Lecture Transcript

Lecture: Conditions that Affect the Spread of Infectious Diseases

Professor: Hello everyone. This is our first lecture on infectious diseases.

Do you remember the outbreak of Severe Acute Respiratory Syndrome (or SARS) in 2003, or the more recent spread of the swine flu? Now, these are cases of infectious diseases that spread on a global scale. How can we keep these infectious diseases under control when they begin to spread? And this is the focus of today's lecture: the conditions that encourage or discourage the spread of infectious diseases. So, first of all, if we're in good health, we are more able to resist disease, and the opposite is also true—if we're nutritionally deficient, or ill with another disease (like cancer) we're more likely to be susceptible.

A clean water supply and efficient water treatment are essential to preventing all kinds of illnesses. Our water systems can contain parasites that lead to schistosomiasis. Schi-sto-so-mia-sis, which is a disease that damages the bladder, the kidney, the liver, and the intestines. The World Health Organization estimates that 200 million people may be infected with the parasite and that 200,000 die every year.

Now, food preparation also affects our health. Gastroenteritis, ga-stro-en-te-ri-tis, which is a disease of the stomach and the intestines, is caused by improperly prepared foods, reheated meat and seafood dishes, dairy and bakery products. The WHO states that gastroenteritis kills 5 to 8 million people per year, and is the leading cause of death for children under the age of five. This, when gastroenteritis can be treated simply by rehydration.

Also, most of us live in large groups, in very large groups, and this makes us more vulnerable to infectious disease. So, let's look at an example to make this more obvious. When a child is exposed to measles, his or her body requires about two weeks to make antibodies to fight the disease. This means that for the measles virus to survive, it must find a new body every two weeks. And this is easily done in a city where children go to school and meet at play groups.

And here's another impact of living together in groups: we have more contact with waste products. We have to manage our waste so that we have as little contact with it as possible because there are many bacterial diseases and parasitic worms that result from contact with human waste. And of course, we have to minimize our contact with animal waste to prevent the spread of disease.

As if this weren't enough, large groups of people attract what we call "agents of disease"—mosquitoes and rats. The kinds of things we do to support large numbers of humans contribute to the spread of disease. Now, to be specific, when we cut down trees for agricultural purposes or for urban development, we create pools of stagnant water, which are breeding grounds for mosquitoes that carry the protozoa that cause malaria. Similarly, large populations of humans tend to attract rats and other rodents that may also be agents of disease.

Our current levels of travel enhance the ability of a disease to spread as well. Like when SARS and the swine flu began to spread, one of the main problems was that unknowingly infected people traveling from one country to another, spread the disease across borders. These people unknowingly spread the disease to populations that had never been exposed to these diseases before. And if you have never been exposed to a disease before, then you have no antibodies, and you're much more susceptible to contracting the disease.

This is nothing new, of course. One of the most horrific examples of this was the Black Death in Europe (in around 1348 to 1350). The Black Death was bubonic plague, caused by bacteria transmitted by the rat flea, which can spread to humans. An outbreak of bubonic plague was recorded in China in the 1330s, and by the late 1340s it had reached Europe. By the end of the epidemic, a third of Europeans, that's 25 to 40 million, had been killed, and we don't know how many Chinese had died. These deaths changed the economic and cultural life of Asia and Europe forever. Similarly, the native peoples of "The New World" also suffered when the European explorers and colonists arrived after 1492. Measles, smallpox, influenza, and whooping cough killed many of the natives throughout North and South America, the Pacific Islands, and Australia. Some populations were completely wiped out, and others had such severe disease rates that their cultures were destroyed.

So all of these conditions influence the spread of infectious diseases:

- how healthy we are
- whether we have access to clean water
- how we prepare our food
- how closely we live with others
- how much contact we have with waste products
- how closely we live to "agents of disease" like mosquitoes and rats
- how much we travel
- how likely we are to be exposed to a "new" disease

These are all conditions that we can take into account in our constant battle against the spread of contagious diseases. Now, the next challenge humans face in the war against infectious diseases is antibiotic resistance. We need to figure out what to do to combat antibiotic resistance. So, antibiotic resistance will be the focus of your reading for next class.

Figure 14. Getting her students to read the transcript of unit 7 lecture as her students listen to it simultaneously, the ESL instructor will decipher where they are. Accordingly, she will pair them up or group them appropriately with their peers, so they can collaboratively discuss the related topic in depth.

It is noteworthy that all of the activities tiered with these ongoing assessments align with the understanding goals (UGs) of this unit topic. Based on the ESL students' learning profiles, interests, and needs, the instructor of this academic preparation course will decipher which student might have inclination toward more assistance as far as his/her deeper understanding of the UGs. The activities were tiered in a way that the students can first figure out the fundamentals of academic vocabulary in their fight with diseases that are infectious. Drawing from this activity, the instructor will then be able pair up or group each student with their

peers in a natural process. Grouping with this tiered activity will occur without her guidance—be the sitting arrangement, grouping styles, learners' profiles, etc. From this activity, three learning gains are expected:

1. Grouping will form in its natural progress, and the ESL students will derive context-related meanings of academic words, developing an appreciation of what metaphorical use of the language is;
2. The students will appreciate the application of war/battle-related vocabulary in real-life settings;
3. They will develop an understanding of certain grammatical structures used to facilitate their academic vocabulary use (i.e., vocabulary quiz).

Conclusion

In light of everything addressed with respect to this unit design created with CCDT, it is critical to emphasize that all of the technologies that can assist with ESL students' meaning making during their learning process were included in the design in a way that development of each academic skill was supported with a particular technology and specific content delivered resulted in as highly authentic and engaging. Besides CCDT as a curriculum design tool, there was yet an additional technology, Prezi, with the support of which almost all of the components of the design were demonstrated. Prezi gives an overview of what components went into CCDT. It is an interactive, animated technology where the guiding principles of ADDIE and constructivist learning theory on which this unit curriculum design was grounded can be observed. Therefore, all of these educational technologies and the purpose of this unit design considered, the educational objective with this curriculum design was to facilitate design, development, delivery, and evaluation of effective instruction, teaching and learning for understanding, and enable students' meaningful, comprehensive learning via which they can direct and master their own learning processes. The design was consistent with the guiding principles of the aforementioned theoretical learning frameworks and the core components of the popular ADDIE model. Under this context, both the theoretical basis for and practical aspect of CCDT can have positive implications both on the part of the adult ESL students and the instructor of this academic preparation course. First, the theory and practice of this design created with CCDT greatly helped concert much effort to justify the effectiveness, efficiency, and authenticity of the subject matter delivered through this design.

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Second, both the art and science of the design are also expected to lead to what the designer of this unit lesson hoped to achieve for all of her students: a comprehensive understanding of and appreciation for the positive impact of CMI-driven learning/teaching in a theme-based adult ESL course. What emerged from this design was a second language learning and teaching environment wherein all of the activities exercised both inside and outside of the classroom can pave the way for "a persisting change in human performance" (Driscoll, 2005, p. 9); in other words, a considerable improvement in not only the instructor's pedagogical, instructional, and CALL-based practices, but most importantly, in ESL students' academic performances in all domains in English.

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Designing E-Learning Healthcare Modules Using Color Preferences And Mayer's Principles: A Comparative Study Between Korean And Malaysian Students

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Abstract
This study was developed as a joint collaborative effort between a Korean and Malaysian university in order to investigate Korean and Malaysian students' perceptions on an e-learning website on health rooms in Korea and the influence of color on their preferences. Colour analysis using a spectrophotometer was used to survey the colors of 10 health rooms in Korean schools and measured. These measured colors were based on Munsell's color system and analyzed using the Image Research Institution) IRI color image scale. These health rooms were then presented to Korean and Malaysian students to measure their colour preferences. An e-learning web module was then developed using Mayer's (2001) Principles of Multimedia Learning and presented to Korean and Malaysian students. A Technology Acceptance Model (TAM) survey was developed to measure their Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU) constructs, and Attitude Towards Usage (ATU) and Behavioral Intentions to Use (BIU) constructs in the application. The results thus show positive technology acceptance of the e-learning health room web module and provide positive encouragement for educators to develop interactive healthcare modules for e-learning.

Introduction

In recent years, multimedia has introduced the pedagogical strength in facilitating student learning and supplementing learning with liveliness as it adds richness and meaning to the information presentation with the use of more than one medium (Shank, 2005; Asthana, 2009). Multimedia involves the synchronisation of media in producing the media-rich outputs and is arranged in some chunks which are linked by the hypermedia. Students can navigate to the source of information in a shorter time, build the connections between relevant topics, and construct their knowledge by associating to the meaningful information (Parekh, 2006). It is important for students to self-adjust the time and determine the information based on individual differences, so that when individual differences can be accommodated by having alternatives in learning, students will then be engaged at a deeper level and appreciate the student-centred learning approach with more sense of participation (Ma, O'Toole & Keppell, 2008). According to Tuparov, Tuparova & Peneva (2004), in the process of developing the

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computer-based learning program, the concern is not on "what technological tools are to be used during the development process of e-learning program", but it is on "how to design and plan an e-learning program that ensures the achievement of the learning objectives". Research has also shown that these technological advancements directly influence the way educational content is now being taught, bringing about changes in the roles of student and teachers in the classrooms (Mahajan, 2012), and making learning more meaningful (Dembo & Seli, 2012).

A popular method of using technology-supported teaching, or e-learning, involves providing students with online access to their learning materials. Educators are transforming their curricula into e-learning materials that involve multimedia elements and interactivity, uploading them onto an online system that would allow students to have access to them outside of classrooms (Palloff and Pratt, 2013), and allowing educators to "*tap the power of visual and verbal forms of expression in the service of promoting student understanding"* (Mayer, 2003). Such a learning environment is deemed to be student-centred as students are empowered with the control and activity of these online modules. In such a learning environment, students are active in their learning process and are involved in acquiring and navigating through the content in the learning modules at their own pace (Svensson & Ostlund, 2007).

South Korea and Malaysia are two of the countries in Asia that have sought to follow in the global educational trend towards innovating curricula and adopt more technology-supported classrooms. The rapid growth of ICT in South Korea has had significant impact on the development of e-learning (Misko, Choi, Hong & Lee, 2005; Kim & Santiago, 2005; Park, 2009), and the "Law for Developing On-Line Digital Contents Industry" was legislated by the South Korean Government for universities to develop digital content and produce more IT graduates for their IT companies (Lee et. al, 2009). In Malaysia, the 'Blueprint on Enculturation of Life-Long Learning for Malaysia 2011-2020' by the Malaysian Ministry of Higher Education (MOHE, 2011), advocates the need to incorporate creativity and innovation into the education system in order to empower 21st century graduates and to embed student-centred learning approaches into the design of their classes. As such, institutions of higher learning in Malaysian are beginning to incorporate ICT materials in developing e-learning methods and in web-based courses (Hong, Abang Ekhsan & Zaimuarifuddin, 2005; Suraya, 2005; Yap, Neo & Neo, 2013).

However, despite the move towards e-learning and technology-supported classrooms, there is still little research on the acceptance of such systems and how they affect the quality of learning among the students' learning process (Lee, 2006, Liaw, 2008; Lee et. al, 2009; Liu,

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Liaw & Pratt, 2009; Leem & Lim, 2007; Park, 2009). In addition, educators still lack confidence in their e-learning developments and proper pedagogical frameworks for designing effective e-learning and student-centred materials are still needed (Chung, 2008; Martin & Klein, 2008).

Methodology

The learning environment adopted 2 areas of development, the colour preferences of physical healthrooms and the designing of the e-learning module. Students' colour preferences on the healthrooms were obtained to gauge their perceptions to the colours used to create these physical rooms. The web module was developed incorporating Mayer's (2001, 2003) principles of multimedia learning and cognitive load. According to Mayer's (2003) cognitive theory of multimedia learning, incorporating multimedia elements into a learning module must be considered in the design of the application, as well as the impact of its interactivity and feedback on student learning, and that the combination of various media elements contribute to determining learners' educational effectiveness, and is critical to the success to having a positive impact in multimedia learning, as it puts the learner in control. The content of the web application was obtained from 10 Korean health rooms located in Busan city, South Korea. These schools were part of the Korean Government's Health Room Modernization Service initiative. The schools selected as part of the initiative were schools with more than 300 students enrolled.

Phase 1: Colour preferences

Research has shown that the use of appropriate colours can significantly affect the attitudes towards using those rooms. In the first phase of the design, the content and images of the schools were collected and their colours measured. The content on the health rooms presented in the website were divided into 3 sections, floor, wall and furniture. The images on the schools were collected during the period August to Sept 2014, during the school's semester break. A spectrophotometer (Minolta CM-2600d) was used to measure each room's hue, value and saturation. The color measurement was based on Munsell's color system. These images made up the images presented in the web application. As posited by Cyr, Head & Larios (2010), colour appeal in web application can influence students' perceptions towards the module. As such, students were given a Semantic Differential scale made up of 20 opposing colour vocabulary terms to measure their colour preferences of these health rooms.

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The opposing terms used in the scale were selected by experts in the university and were from the Image Research Institute's (IRI) list of vocabulary terms. Positive terms included, "soft", "light", "vivid", "calm" and "happy", while negative terms included "hard", "heavy", "vague", and "sad", and were given a 5-point scale to measure their preferences. Table 1 shows the list of opposing terms used in the semantic differential scale.

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Table 1 Terms used for colour preferences

Items	Positive	Negative
1	Soft	hard
2	light	heavy
3	clear	muddy
4	Mild	strong
5	feminine	masculine
6	young	old
7	happy	sad
8	Cute	elegant
9	dynamic	static
10	vivid	vague
11	glamorous	modest
12	artificial	natural
13	breezy	dull
14	simple	complicated
15	calm	active
16	modern	traditional
17	funny	boring
18	new	conservative
19	oriental	western
20	Korean	Malaysian

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Phase 2: Design of web application

The web module was developed incorporating Mayer's (2001, 2003) principles of multimedia learning and cognitive load. According to Mayer's (2003) cognitive theory of multimedia learning, incorporating multimedia elements into a learning module must be considered in the design of the application, as well as the impact of its interactivity and feedback on student learning. The combination of various media elements contribute in determining learners' educational effectiveness, and is critical to the success to having a positive impact in multimedia learning, as it puts the learner in control. The seven principles are Multimedia Principle, Spatial Contiguity Principle, Temporal Contiguity Principle, Coherence Principle, Modality Principle, Redundancy Principle, and Individual Differences Principle as listed below (Mayer, 2001):

Table 1 Mayer's 7 Principles of Multimedia Learning

Design Principle	Principle's Explanation
1. Multimedia Principle	Use text and graphics together to enhance learning experience.
2. Spatial Contiguity Principle	Arrange related text and graphics close to each other on the screen to enhance learning.
3. Temporal Contiguity Principle	Have the related text and graphics to appear at the same time on the screen to enhance learning.
4. Coherence Principle	Irrelevant or additional text, graphics, and audio are not included on the screen.
5. Modality Principle	The combination of animation and narration will enhance students' learning.
6. Redundancy Principle	Text shall not be included when animation and narration are presented on the screen.
7. Individual Differences Principle	Students who are new learners for the module and high-spatial learners would have better learning effect from the design.

These principles were incorporated into the web module, uploaded to a server to be accessible 24/7, and presented in both Korean and English languages, where Koreans students would access the Korean site, and Malaysian students would access the English site. However, both languages were available at all times, for students to explore. Figure 1 shows some of the principles that were incorporated into the website design.



Multimedia Principle: Picture to assist in the textual content.



Temporal Principle: The picture which supports the explanation in words appears

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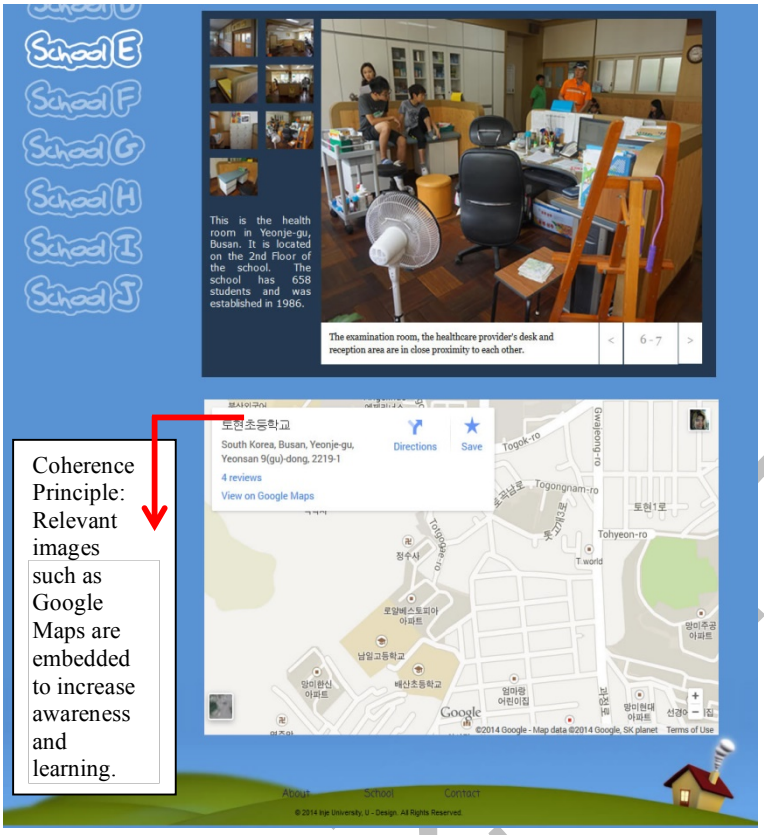


Figure 1 Incorporating Mayer's Multimedia, Temporal and Coherence Principles into the website design

As can be seen in Figure 1, components such as Multimedia, Temporal and Coherence were some of Mayer's Principles that were incorporated into the design of the website in order to facilitate a better learning process. Graphics were placed next to text to enable students to process both visually and textually the same content, thus creating an enhanced learning experience for them and to enable a more effective processing of the information onscreen. Information that were relevant were presented in the website and coupled with GoogleMaps to provide students instant location identity, placement and awareness. In addition, each of the school's images appears when the user clicks any of the thumbnails. Textual explanations and descriptions of each of the images appear at bottom of each image at the same time. That way, learners will be able to focus on the information presented, and not experience any cognitive overload.

In order to measure students' intentions to use the website (IU), the Technology Acceptance Model by Davis (1993) was adapted into developing a questionnaire, to measure their Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). The questionnaire was administered to 133 Korean and Malaysian students in the design faculties of Inje University, South Korea, and Multimedia University, Malaysia, respectively. There were 67 Korean

undergraduates and 66 Malaysian undergraduates who participated. The questionnaires were translated in Korean (for the Korean students) and verified by language experts in the faculty, to maintain the integrity of the items asked. The questionnaire scale ranged from 5 = Strongly Like, 4 = Like, 3 = Undecided, 2 = Dislike, and 1 = Strongly Dislike and were analysed using SPSS 16. In addition, open-ended questions were asked of the students to solicit their comments on the learning environment and are reported below.

Analysis And Results

Colour Preferences Analysis

Items on the semantic differential scale were measured on a 5-point scale, with 5 being closest to the positive items, and 1 being closest to the negative items, for each of the 10 schools. Results of these scales for the 10 schools for Korean and Malaysian students are presented in Table 2 below.

Table 2 Mean scores for the items for each school

School A		School B		School C		School D		School E	
Korean	M'sian	Korean	M'sian	Korean	M'sian	Korean	M'sian	Korean	M'sian
Item 14	Item 1	Item 6	Item 2	Item 14	Item 14	Item 15	Item 19	Item 15	Item 14
simple	soft	young	light	simple	simple	calm	western	calm	simple
3.84	3.94	3.71	3.59	4.01	4.18	3.86	3.49	3.56	3.38

School F		School G		School H		School I		School J	
Korean	M'sian	Korean	M'sian	Korean	M'sian	Korean	M'sian	Korean	M'sian
Item 3	Item 2	Item 10	Item 6	Item 2	Item 16	Item 11	Item 16	Item 15	Item 12
clear	light	vivid	young	light	modern	glamorous	modern	calm	natural
3.73	3.93	3.80	3.49	3.69	3.90	4.15	3.84	3.98	4.0

Results from the semantic differential scale showed that both Korean and Malaysian students reported more positive colour preferences on the colour vocabulary items presented. Colour preferences for Korean students included colour vocabularies such as "simple", "young", "calm", "clear", "vivid", "light", and "glamourous", whereas colour preferences for Malaysian students included vocabulary such as "soft", "light", "simple", "western", "light", "young", "modern" and "natural". These vocabulary items were positive and showed that both groups of students had positive attitudes towards the colour scheme of the healthrooms, which are supported by the e-learning website results below.

Healthroom Website Analysis

Analysis of the questionnaires for both Korean and Malaysian students yielded Cronbach Alpha coefficient of over 0.9 (0.905 for the Korean students' surveys, and 0.922 for the

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Malaysian students' surveys), which clearly showed that the survey was reliable (Lim, Khine, Hew, Wong, Shanti & Lim, 2003). In terms of the technology acceptance model, the survey developed measured three constructs: 1) Content, 2) Visual Appeal, and 3) Interactivity and Navigation. As mentioned earlier, Content and Visual Appeal constructs would generate results for students' Perceived Use (PU) and the Navigation construct would generate results for students' Perceived Ease of Use (PEOU). Table 3 presents a comparison of Korean and Malaysian students' survey responses, which were mapped to the constructs of the Technology Acceptance Model, and their comments.

.**Table 4 Korean and Malaysian students' responses on the survey questionnaire**

	Koreans (n=67)		**Malaysians (n=66)**	
Items on survey questionnaire	**Mean**	**%**	**Mean**	**%**
1. Ease of buttons and links to navigate (PEOU)	4.03	88.1	3.95	75.8
2. Understanding of content (PU)	4.00	79.1	4.08	81.8
3. Suitability of furniture for health rooms (PU)	3.97	79.1	3.83	72.7
4. Ease of navigation (PEOU)	3.94	70.1	4.09	86.4
5. Increased understanding of Korean Health rooms (PU)	3.85	71.6	3.95	77.3
6. Suitability of colours of the health rooms (PU)	3.84	62.7	3.88	78.8
7. Instructions were easy to understand (PEOU)	3.82	68.7	3.98	78.8
8. Liked learning about health rooms in Korea (PU)	3.69	62.7	3.44	51.4
9. Just the right amount of information on screen (PU)	3.69	65.7	3.62	56.1
10. Liked the colours of the rooms (PEOU)	3.66	62.7	3.89	71.2
11. Enjoyed learning from the website (PU)	3.34	43.3	3.82	66.7
12. Informative and useful website (PU)	3.63	55.2	3.82	74.2
13. Important information were easy to find (PEOU)	3.51	49.2	3.80	68.7

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Comments from students

1. *"It's useful and necessary"*
2. *"Need! People need it for their children's environment, as beneficial to the family that are wondering"*
3. *"Really useful…I can see the different between health rooms in Malaysia and Korea"*
4. *"…it given opportunity to other people to learn about health rooms in Korea and allow other school to reference and make their health room better"*
5. *"..it's good because it together with photos and descriptions"*
6. *"Colour scheme is nice and comfortable…It is calm…patients are able to rest peacefully"*
7. *"I like the colour. It catch my eye attention. Good!"*
8. *"I think the color is bright and colourful. Sets up the mood for the student"*
9. *"Calm and relaxing"*
10. *"Colours used for this website were suitable according to the furniture and light in respective rooms"*
11. *"I liked the website is so simple and easy to use."*
12. *"The navigation is most appealing for this website"*
13. *"..I'd use it to get information. It could be so useful not only for children, but also their parents as well."*
14. *"Yes, I'm going to use it."*
15. *"I'm going to use it when I need the information regarding the health rooms."*

Koreans and Malaysian students reported favourable attitudes towards the items in the survey questionnaire, with many items scoring over the midpoint of 3 on the scale. 88% of Korean students and 76% Malaysian students reported that they found the buttons and links in the module easy to understand and were able to bring them to the correct pages (m=4.03 and m=3.95), and 79% Koreans and 82% Malaysians were able to understand the content in the website (m=4.00 and m=4.08), both of which ranked first and second in the survey. 79% Koreans and 73% Malaysians found the furniture in the healthrooms suitable (m=3.97 and m=3.83). Navigation was also favourably reported by 70% of the Korean students and 86% of Malaysian students (m=3.94 and m=4.09), as were the instructions in the website (m = 3.82 and m=3.98; 69% and 79%, respectively), which enabled them to gained more knowledge of Korean health rooms (m=3.85 and m=3.95; 71.6% and 77% respectively), and received enough information on each screen to process (m=3.69 and m=3.62; 66% and 56%, respectively). 63% of Korean students and 79% of Malaysian students also found that the colors chosen for the healthrooms in the website were suitable for the students who will be using them (m=3.84 and m=3.88, and m=3.66 and 3.89, respectively). Overall, Korean and Malaysian student found the website useful and informative (m=3.63 and m=3.82; 55% and 74%, respectively).

Comments from students also supported the results as they reported that the website's navigation and content were important elements and appealing to them in their attitudes towards the learning environment. Based on their comments, students were positive in the

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module's Perceived Ease-of-Use (PEOU) and Perceived Usefulness (PU), which in turn positively influenced their Attiudes to Usage (ATU), and consequently, their Behavioral Intentions to Use (BIU) the application.

Discussion And Conclusion

Results of the study showed that the colour preferences have an impact on students' perceptions and attitudes towards the e-learning module and to the health rooms in general. In particular, the study showed that Mayer's (2001) Principles of Multimedia Learning was an effective theoretical framework to use to effect these positive perceptions. Colour was an effective component of the module to engage students in the application. Students reported and commented on the suitable use of colour as a way to affect the mood of the audience and provide a calm and relaxing atmosphere for them to engage in the module. This result is consistent with Cyr, et. al's (2010) suggestion that *"website colour appeal is a significant determinant for website trust and satisfaction…"*(p.1), and Gaines & Curry's (2011) conclusion that colour has significant influences in learning environments.

Interestingly, Korean students commented more about the necessity of the web module, while Malaysian students commented on the usefulness of the web module as a reference for development or improvement for Malaysian health care rooms. User-friendliness and easy navigation were also important elements in their overall perceived intentions to use. Many commented that they would use the website because it provided useful information, was deemed necessary, was easy to use and convenient. These results were consistent with Schroff, Deneen & Ng's (2011) findings that user-friendliness and easy navigation were influential components in students' PU and PEOU of technology.

In conclusion, the web module and the use of Mayer's (2001) Principles of Multimedia Learning was an effective tool to engage students in interactive learning with an e-learning application. The technology acceptance model (TAM) was also an effective model to use to measure the attitudes and perceptions of students on the perceived usefulness and ease-of-use of the module and their consequent perceived intentions-to-use the module in the future. The study also provide insights into the attitudes and perceptions of Korean and Malaysian students towards using e-learning modules, and to gives educators further confirmation on the effectiveness of using sound multimedia and e-learning pedagogy in designing content that will engage and improve student learning.

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E-Content Design For Tabletpc Implementation Project*

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Abstract
This paper presents the findings of a study conducted with a 1st grade students in an elementary school to test e-content modules developed for TabletPC implementation during a grant project called "Development and Implementation of Handwriting Recognition Technology Used in Smart Classrooms" and supported by the Scientific & Technological Research Council of Turkey (TUBITAK). The effectiveness of the use of the developed technologies for handwriting recognition and the use of the learning modules by both students and teachers are investigated. Reflections from students and teachers are discussed.

INTRODUCTION

The emergence of educational technology emphasizes the use of mobile technologies in education. Mobil computers are now part of our everyday lives and kids enjoy with playing games, watching movies, and communicating with the world. TabletPCs are a format of a mobile computer that can be used to facilitate students' learning processes in classroom settings (e.g., Moran, Hawkes, & El-Gayar,2010; Twining et al., 2005; Wise, Toto, & Lim, 2006). From an instructional point of view, beneficial features of TabletPCs range from the availability of tools such as simulations, digital books, and movies to interactive learning networks, a high mobility and an instant usability that can contribute to a student-centered learning and to a more differentiated form of instruction (Ifenthaler & Schweinbenz, 2013).

The previous studies about the use of TabletPCs in schools in the world are reviewed during the development of this proposed study (e.g., Aitchison, 2004; Amirian, 2004; BECTA, 2004; BECTA, 2005; Condon, 2004; Liu, 2003; Mock, 2004; Roschelle, 2003; Scheele, 2004; Schroeder, 2004; Zurita & Nussbaum, 2004a; Zurita & Nussbaum, 2004b). When it comes to the implementation of TabletPCs in education, one of the projects and publications about the use of TabletPCs in education and integrating them to lessons was conducted by BECTA (British Educational Communications and Technology Agency) in

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England and Open University collectively in 2004 (BECTA, 2004; BECTA, 2005).Other previous studies include a study on effects of homework system implemented on TabletPCs to support understanding of learning materials between school and home and to support individual learning (Kerawalla et al.,2007;Mock, 2004; Schroeder, 2004; Sheehy, 2004) and field researches on the use of TabletPCs for mathematics teaching(Aitchison, 2004; Galligan et al., 2010; Trouche & Drijvers, 2010). Although TabletPCs are more costly than desktop or laptop computers, the use of TabletPCs in education is more preferable. The reasons to choose of TabletPCs instead of the Laptops have been summarized as follows (BECTA, 2004; BECTA, 2005; Li et al., 2010; Twinning et al., 2005):

- Providing a reasonable screen width for elementary school students who still have limitations about reading proficiency,
- Supporting the software of Windows XP and Windows Vista,
- Having handwriting recognition qualification through which students can develop their handwriting skills,
- Sharing documents, reconfiguration and rewriting together by means of OneNote implementation with the help of TabletPC network,
- Taking less space in the classroom,
- Accelerating and facilitating the movement in class,
- Facilitating the use at work based on the convenience of taking notes with one hand while grasping the TabletPC with the other, and
- Being easy to use pencil and to learn using pencil.

The use of TabletPC in education shows some promises for educational technology projects. Some of the main results of the previous projects and research studies are summarized as follows (e.g., BECTA, 2005; Li et al, 2010; Twinning et al., 2005; Wise et al., 2006):

- The common idea reached from the sample researches is TabletPCs have important impact on students' motivation.

- TabletPC user schools have stated that the most important feature of TabletPCs is its feature of handwriting recognition and reported that this feature supports the writing skills of students who have difficulties in writing depending on age and the development of fine motor muscles.

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- Some schools reported that students have found using TabletPCs enjoyable and for this reason, they reported the use of TabletPC created energy for students to address the issues they have previously found difficult in the curriculum.

- The opportunity of audio and video inputs to TabletPCs has enabled students to be able to add verbal comments to the assignments. One school reported that it strengthens communication with parents.

CONTEXTUAL BACKGROUND

This study conducted with 1st grade students in an elementary school to test e-content modules developed for TabletPC implementation during a grant project. The grant project called "Development and Implementation of Handwriting Recognition Technology Used in Smart Classrooms" supported by the Scientific & Technological Research Council of Turkey (TUBITAK). In Turkey, there is a big scope project which is the Ministry of National Education's FATIH Project (Movement for Increasing Opportunities and Improving Technology in Education). Related to the FATIH project, TabletPCs started to be distributed to K-12 students, however; accompanying technology and e-content was yet to be developed in 2012. In parallel with the FATIH project, the projects within the TÜBİTAK Priority Areas program (1003) proposed for the development of innovative educational technologies and methods that enable students to learn more effectively and productively in Turkey in 2013.

The project "Development and Implementation of Handwriting Recognition Technology Used in Smart Class" aimed to provide hand writing recognition technologies and e-content support for teaching 1st grade curriculum. The project proposed to develop core handwriting recognition technologies and e-content, along with an application for demonstrating their use. Within the project, interactive educational software is developed to motivate students to learn, increase their learning speed, and enable them to learn from their mistakes with immediate feedback. As further benefit, it enables teachers to grade the answers and timing of students' work. The developed handwriting recognition in Turkish can also be used in the infrastructure of many different systems within the FATIH project.

DEVELOPING E-CONTENT

E-content parallel to the targeted achievements by the curriculum suitable for the elementary school 1st grade curriculum was developed. The developed e-content included

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sample questions and interactive learning activities appropriate for handwriting recognition technology. E-content was presented with four modules: Hand Writing, Turkish Questions, Math Arithmetic, Math Questions. As a priority of the development of these modules, sample activities were prepared in accordance with the learning areas in parallel with the 1st grade Turkish and mathematics programs and teaching guides which are arranged by the Ministry of Education. In this preparation, questions prepared by other teachers and web resources were utilized. Exercises and activities were selected in accordance with the processing time of the specified topics in the curriculum. The appropriate selection of the content was prepared with instructional designer and subject matter experts. However, it was important how these materials would be added to the software (i.e. how an illustrated question and its answer could be installed to the software). Special attention was paid to design learning materials in order to motivate the students, make them active, and give the opportunity to students to see their own assessments. While preparing the e-content, the details of pilot evaluation of the design were arranged considering the following criteria:

- the connection to the subject, the course objectives and the learning outcomes,
- the structure to support teaching and to influence learning,
- the feature of communication support,
- the property of giving feedback,
- the attraction of students and student motivation,
- the design properties, ease of use, and reusability.

The following paragraphs about the developed modules with screen shots from the program illustrate the first version of the developed e-content.

The Modules for Students: The project team has decided on four core modules that would be most related to handwriting technologies: Hand Writing, Turkish Questions, Math Arithmetic, Math Questions. These are presented in the entrance of the application that is illustrated in the following figures. Figure 1 shows the first screen with 4 modules. Figure 2 shows the login page. Figure 3 shows the Hand Writing module. Figure 4 shows the Turkish Questions module. Figure 5 shows the Math Arithmetic module. Figure 6 shows the Math Questions module. Figure 7 shows a sample feedback page.

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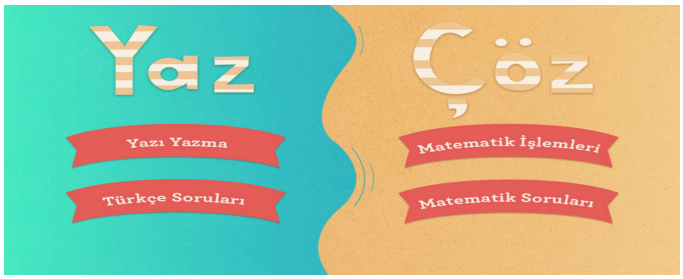


Figure 1. First Screen with 4 modules.



Figure 2. Login page where the student writes her/his name and selects an avatar.



Figure 3. Hand writing module where students are asked to write the given text.

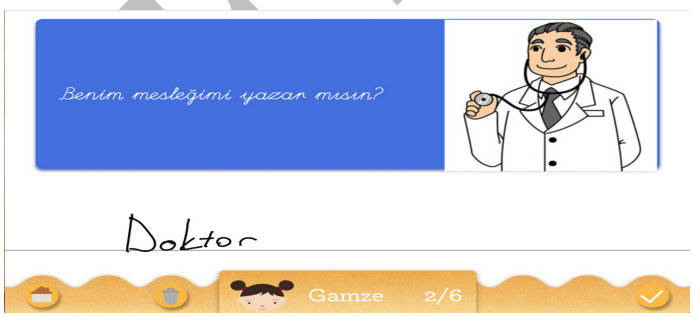


Figure 4. Turkish questions module (‘Can you write my profession?’).

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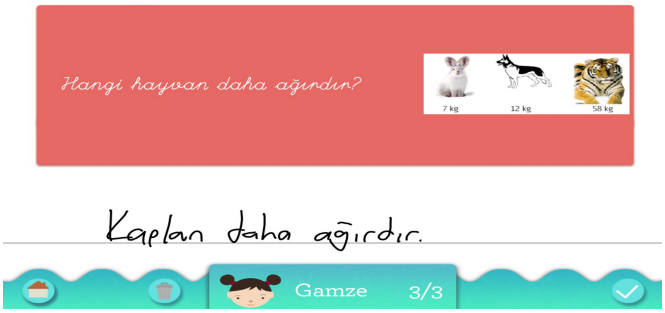


Figure 5. Math questions module ('Which animal is heavier').

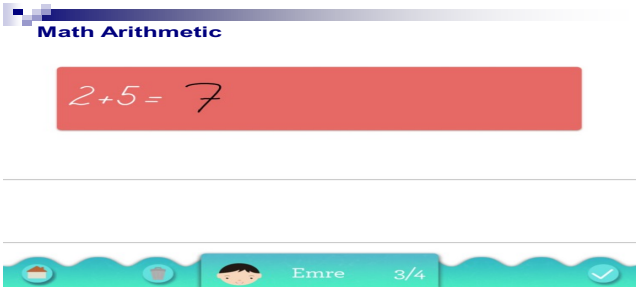


Figure 6. Arithmetic module.



Figure 7. Sample feedback for a wrong answer.

The part for teachers: The program allow teachers to enter their own questions, select the questions from the database, review students' answers, give feedback to students, and assess students' work. Figure 8 shows the screen that allows teachers to enter new questions or select a question from the database. Figure 9 shows the screen that allows teachers to review the students' responds.

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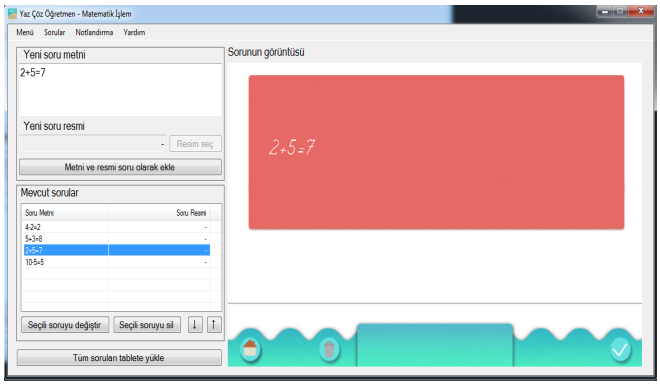


Figure 8. The screen for teachers to enter questions.

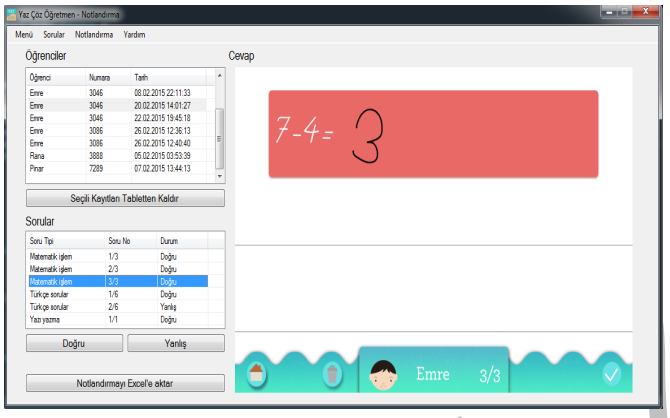


Figure 9. The screen for the teachers to review the students' responses

CONDUCTING IMPLEMENTATION AND ASSESSMENT

The implementation was conducted with 5 classroom teachers working in an elementary school in Istanbul, (metropolitan city in Turkey) in the Spring of 2014. Teachers participated to the implementation with a heterogeneous group of 4 students from different levels. Before the implementations, teachers were trained about the implementation and the students were informed about using TabletPC. During the implementation, all 4 modules were tested. A total of 20 students have participated in the implementation. Developed instructional technologies and the functionality of the learning material, whether it is easy to use or not and pedagogical compatibility tests were done. Student and teacher evaluation forms and teacher observation forms of the implementation were used as research and evaluation methods. In addition, the project researchers did semi-structured interviews with teachers and students. The project team collected data through observation as a passive participant as well as the interviews before and after the work.

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Four separate assessment forms were used during data collection and implementation. Firstly, *Pre- implementation Teacher Evaluation Form* was applied to the teachers. In this form, teachers' approaches to the implementation in their lessons and their attitudes and thoughts on the use of TabletPC were collected. Secondly, *Teacher Observation Form* was distributed to the teachers in order to collect their observations of the students using the application. Thirdly, *Student Evaluation Form* was given to the students at the end of the implementation and their ideas on the use of TabletPC were taken. Finally, with the *Post-implementation Teacher Evaluation Form*, teachers' opinions, suggestions and criticisms about the implementation were taken at the end. Data was systematically collected and analyzed. Qualitative research data from semi-structures teacher interviews and student interviews was analyzed and interpreted by comparing the quantitative data. The evaluation results are summarized as below.

The structure of implementations by student participants: As it has been planned, the evaluation was carried out with the participation of a total of 20 students from 5 different 1st grade classes, in 4 groups and 5 times in successive sessions. There were students from different academic levels in each group: there were very good students in the groups as well as students who follow the course slowly, or write from the opposite direction, or those who are hyperactive and talkative. About 10% of the students had used TabletPC for just playing games or watching movie although 90% of the students had never used the TabletPC before the implementation.

Observations: Based on the first test results from a heterogeneous group of 20 students with different learning abilities and levels, it was observed that all students in different levels focused very well while answering the questions and writing the answers. Even though %90 of these students has used TabletPC the first time during the evaluation, students stated that they have enjoyed using TabletPC for the exercises of the modules. Students' feedback about the activities in four modules included that activities and questions were clear to understand and have good visual selections.

Students' Perception: As a result of interviews with students, 18 students from 2O students stated that they loved using TabletPC; 16 students stated that they did not have any difficulty during using TabletPCs; 14 students noted that they would prefer to use TabletPC instead of the paper; and 3 students indicated that they liked using TabletPC although they

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had difficulties during writing with the pencil of the TabletPC. 2 of these 3 students were also stated that they would still prefer to use TabletPC instead of the paper.

The codes from students' interviews about the evaluation of the implementation and the use of TabletPC can be listed under the four main themes: 1) students' attitudes towards using TabletPC for activities in the modules; 2) students' behavior during using TabletPC for activities in the modules; 3) students' intention to use TabletPC; and 4) students' experience about using TabletPC. These four themes and related codes are summarized as below:

1) Students' attitudes towards using TabletPC for course activities:

- Using the TabletPC for course activities is fun and enjoyable
- It feels good to use the TabletPC for course activities
- It is interesting to use the TabletPC for course activities

2) Students' behavior during using TabletPC for activities in the modules:

- It is easy to use the TabletPC for course activities
- The directions to use the modules in the TabletPC are simple
- It is easy for me to answer questions by using the TabletPC.

3) Students' intention to use TabletPC:

- I will use the TabletPC for course activities at school
- I will use the TabletPC to study or for homework
- I will use the TabletPC to play games with my classmates

4) Students' experience about using TabletPC:

- I have not used the TabletPC during classes at school
- I have not used the TabletPC to study or for homework
- I have used the TabletPC to play game or watch video outside the school.

Teachers' Attitudes: There were five teachers in the evaluation. The teacher survey was conducted before and after the implementation, in addition to individual interviews with teachers. Three teachers from five teachers have had no idea about using TabletPC in their classrooms before the evaluation, because these three teachers did not use TabletPC in their daily lives.

After the evaluations, five teachers stated that they were surprised to see the use of TabletPCs with pleasure and motivation by all students. About the evaluation of the application; 5 teachers expressed that all of the students reached the modules easily, could use them independently, be able to answer all the questions on time and enjoyed the practice.

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Only 1 of the teachers indicated that two students had physical difficulties on writing with the pen of the TabletPC. Teachers stated that the students, who have not used TabletPC previously, were slower than the students who used TabletPC in their daily life. But still these students could complete the practice on time. One of the teachers claimed that students finished the practice very quickly because they competed with each other in order to finish. All of the teachers indicated that the students easily adapted to the practice TabletPC, tried to understand the content, and responded the questions quickly.

About the pilot modules; it was noted that the teaching material was appropriate for the student level, for gaining the target behavior. Furthermore, the visuals and texts were suitable for students. Only one of the teachers claimed that some of the questions were difficult for two students over five students in his/her classroom. Furthermore, all of the teachers stated that using TabletPC was interesting and made students active. Teachers emphasized that they can integrate using TabletPCs in the appropriate part of the course plan, but only if well-prepared e-content modules are provided.

CONCLUSIONS

In this small size study, small numbers of students from different educational background test the modules by using the TabletPCs. Students enjoyed and successfully completed given tasks during this test. The developed e-content modules allowed students to exercise with the provided modules and also allowed teachers to monitor students' work and provide timely feedback. TabletPC, the forms of the applicability for the purpose of this project, can be used for:

- Drill and practice,
- Differentiated instruction for
- individuals,
- Using e-content to support instruction,
- Represent content in an attractive way,
- Computer-driven and evaluated tests,
- Providing instant feedback to students.

Integrating learning modules within the TabletPC into learning activities requires some major change in education. This change includes a number of developments ranging from the practice of the new training methods to the differentiation of the equipments used in

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education. Integrating TabletPCs into classroom instruction to improve students' learning as well as the effectiveness of teachers' instructional methods requires acceptance by teachers and students besides having well-developed instructional materials to support learning and teaching activities. Yet, to be advantageous for classroom instruction, TabletPCs need to be accepted by students and teachers. Ifenthaler and Schweinbenz (2013) pointed out that the previous researches shows the integration of TabletPCs often fails due to a lack of acceptance by its potential and also the attitude of teachers towards TabletPCs show diversity. Successful implementation may be possible by teacher training and providing support during adaptation of using the new technology and instructional materials.

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Effects Of Web-Based Homework On Students' Performance In Freshman Calculus At An American College In Lebanon

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Abstract
In recent years, course management systems have become widespread and book publishers have been competing to develop systems with distinguished learning features. Integrating learning systems in the teaching and learning processes has taken many forms and shapes. This paper is a preliminary report on a case study at the Lebanese American University in Beirut, Lebanon, where one such system was introduced as a tool for assessment in freshman level Calculus. More specifically, the paper compares students' performances on the online assignments vs. their performances on the final exam; the times spent completing the online homework are also analysed. The study concludes no significant connection between the two performances, but finds that the times spent online may be in some instances an indication for weaknesses, hence allowing instructors to target them in the teaching process.

INTRODUCTION

Computer technology has established itself as an important and essential player in the teaching and learning of mathematics. The use of these technologies is helping instructors teach mathematical concepts using various approaches. Learners are now able view these concepts not only from an algebraic point of view, but also from a numerical and visual viewpoint (Kaput, 1992; Porzio, 1999). Until recently however, technology has not been given the same importance or significance in the assessment process; paper based homework still constituted the main if not the only tool for evaluating students especially if mathematical skills such as the development of math arguments are being assessed. According to Engelbrecht and Harding (2004), 'much effort is expended on curricular innovation without the same effort being applied to assessment innovation'; the authors add that many instructors claim to be reformed teachers but they do not think about innovative assessment methods.

In recent years educators have begun exploring innovative assessment pedagogies (Law *et al*., 2012). It is now agreed upon that assessment should be part of the learning process and

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that web-based homework systems (WBH) can be one effective tool for that. In fact, NCTM Standards (2002) called for a continuous assessment process and suggested to use an online assessment approach because it allows multiple re-takes of homework problems. In addition, and unlike traditional paper-and-pencil homework (PPH) that merely evaluates students with little attempts to improve their performance, WBH systems feature also instant feedback, immediate assistance with problems, a one-to-one learning situation, and in some cases individualized problems. Ponomarenko (2003) points out that PPH assignments lose their pedagogical values because many a time students receive feedback well after the assignments have been completed (assuming that students receive any feedback at all). Large class size has been cited as one main cause for this latter issue. Hauk and Segalla (2005) quoted a NCES statistical analysis (1998) in which it was found that the teaching load for a mathematics instructor at a publicly funded U.S. college was approximately 100 students per term. These large numbers have contributed to a decrease in popularity of PPH and a growth in popularity of WBH systems. Moreover WBH as a time saving tool allows instructors to use their class time more efficiently and in a way that promotes adaptive learning (Affouf *et al*., 2007; Lenz, 2012). Indeed, analytics provided by such systems may inform instructors on the difficulties encountered by students, hence allowing teachers to focus in class on troublesome areas of knowledge. WBH can also be beneficial for students; Vidavodic *et al*. (2003) point out that online assessment is a vehicle to empower students to be self-reflective learners who can monitor and evaluate their own progress. Hargis (2000) highlighted other benefits for WBH such as students' active participation in the learning process and students' increase sense of inquiry.

This paper is the result of a study conducted at the Lebanese American University (LAU), a liberal arts American university operating in Lebanon, where an online assessment tool is used in freshman level mathematics courses (Calculus 1 and 2). Historically, the success rate

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in these courses at LAU has been on the low side. As a result, course instructors/coordinators have been searching for means to provide additional academic assistance to students enrolled in these classes. Since most mathematics courses rely on homework to reinforce what has been learned in class, WBH has been considered as one such reinforcement tool. There are three models in which WBH can be used: Either the course itself is taught completely online including not only homework but also quizzes and exams, or the course is taught in a traditional way and homework are web-based only, or a third model similar to the preceding one but homework assignments are a combination of WBH and PPH. The study is conducted in classes where the third model was applied. Because of the differences between the WBH environment and the PPH one, researchers have tried to find the relationship, if any, between students' performances and that environment. Numerous studies have addressed the effectiveness of WBH in a mathematics class as opposed to an assessment using paper-and-pencil homework. Some results have found a positive difference in grades for students using WBH assignments (Hirsh, 2003; LaRose, 2010; Zerr, 2007), while others found no significant difference in outcomes (Hauk & Segella, 2005; Lenz, 2010). The current study falls within the same framework of research studies.

The collection of data began in the Spring of 2012 when a management learning system called MyMathLab (MML) developed by Pearson Publishers was introduced for assessment purposes. Further data were also collected in the subsequent Fall 2012 and Spring 2013 semester. As mentioned above, homework assignments were a blend of WBH and PPH. Like many similar systems, MML's goal is to facilitate learning and to perform immediate assessment, be it through web-based homework or online quizzes. MML comes with many tools (that are self-explanatory): *View an Example*, *Practice Exercises*, *Homework*, *Help Me Solve It*, *Take a Test*, *Gradebook*, *Study Plan*, *Multimedia Library*, and *Communication*. As such, this learning system may be made useful if students are made familiar with the various

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tools available and utilize them in their full capacity and if instructors use these tools wisely so as to complement the traditional classroom teaching environment.

MML and other similar learning systems have been available for some time now and research has been conducted to assess their importance in the learning process. Lenz (2010) for instance reported on the results of a study conducted with mathematics instructors and students of a Finite Mathematics class using MML. Instructors observed that the automatic feedback (automatic grading of the assignment) and the step-by-step guidance are two useful features of the learning system. They argued however that teachers can "no longer examine the students' methodology and do not have written communication with the student through frequently collected assignments" (p. 235). Students also appreciated the automatic feedback and assistance anytime and anywhere. But the disadvantages recorded by the students included the non-detailed feedback on problems (e.g. Ponomarenko, 2003).

This paper discusses the effects of WBH assignments on acquiring the learning outcomes of a Calculus 2 class. More specifically, the main questions addressed in this study are:

1. Does WBH contribute to a better student' performance?
2. Can the data provided by online learning tools be used by instructors to improve the learning opportunities of the students?

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THE SETTING

The Lebanese American University (LAU) is located in the capital city of Beirut; it is chartered by the state of New York and accredited by the New England Association of Schools and Colleges (NEASC). Unlike American universities, Lebanese students enrol at the sophomore level because they complete the traditional freshman requirements in High School. For this reason, freshman level courses are offered primarily to non-Lebanese students or Lebanese students who have completed their schooling outside Lebanon. There are special

cases such as students wishing to enrol in computer science or engineering but do not have the adequate mathematical background as reported by their school grades or their SAT scores.

MML was introduced in the Spring of 2012 in two multi-section freshman level courses: Calculus 1 and Calculus 2. Faculty teaching these courses underwent a series of workshops; but in response to some concerns, fears, and opposition by some, WBH was initially made optional. The set-up was similar in Fall 2012, but in spring 2013, the use of MML became mandatory and the grades earned from the online assignments constituted 5% of the final grade. During that semester, one of the graduate students/instructors was employed to serve as MML coordinator because of her expertise with the tool. The coordinator organized two training sessions for students, one at the beginning of the semester in which the basics of MML were introduced and one a month later where the tool was explored further. The coordinator also coordinated with the course instructors for posting the online assignments and for gathering the required students' data. Homework problems were chosen so as to assess the courses' learning outcomes as stated in the syllabi.

DATA COLLECTED AND RESULTS

The data collected for the study included instructors' impressions of the online tool in Calculus 1 ad 2 (7 instructors in all), results of a questionnaire distributed at the end of each semester, Calculus 2 students' performances on the web-based homework in Spring 2013 when the tool became mandatory, and brief interviews with 4 volunteers from the same class. The study also compares the MML results of the 4 interviewed students with their performances on the final exam.

Instructors' and Students' Feedback

Discussion meetings were regularly scheduled with the course instructors to assess the use of MML and how it can be enhanced to improve the learning environment. Instructors quickly realized "the instructional power of the tool", as was put by one of them. The instant

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feedback, the complete match between the tool and the corresponding textbooks, the variety of content delivery modes are features that instructors came to view as very important. By implementing WBH assignments, instructors noted the value of knowing exactly how much time a student has spent doing the homework. They noted also the value of being able to monitor individual performances of students and therefore efficiently target areas of deficiencies whether at individual levels or at the level of the class. Instructors however admitted that they have not been using this feature properly because of time constraints.

Students also appreciated many features of the tool as was revealed by questionnaires (see Appendix) distributed to all classes, objects of the study, starting Spring 2012. Results revealed that 74% of those who responded (88% return rate) indicated an overall satisfaction with the online tool. Seventy four percent (74%) of those who returned the questionnaire considered *View an Example* as the most useful tool, followed by *Help me Solve it* (45%); 62% considered MML as useful and helpful and 68% prefer to take a math course that requires MML. The questionnaire ended with an open question asking students for any additional comments on the learning system. Here are excerpts of answers received:

‘‘If MML was included in every math course, I would be taking a whole lot math courses.”

“Never had I excelled in math like this and maintained what I have learned.”

“This software enhances the learning experience and provides instant feedback.”

“I credit a lot of my passing grade to MML.”

“I am able to learn math and practice it without being discouraged.”

But students complained about the non-detailed feedback provided by the tool; a student wrote that in a PPH assignment, “one can get partial credits for the method of solving.” Only 28% recommended that quizzes be assigned on MML; students were concerned that in an

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online quiz, one "can open the textbook while doing the online quiz, so grades are not indicative." Few students also criticized MML for requiring answers to be written in a specific format (e.g. 1.5 instead of $\frac{3}{2}$), causing a wrong overall assessment. Others also complained that "the homework given on MML is really difficult to an extent that I need help from the outside"; one student noted that "MML problems are considerably different from the quiz/exam problems."

Students' Interviews

Short and semi-structured interviews were conducted at the end of spring 2013 with 4 student volunteers from Calculus 2; these are given the pseudonyms Joanna, Ron, Chris, and Jane. The former two had used MML in Calculus 1; Jane and Chris were never enrolled in this class because they were not required to take it. All 4 students had not been exposed to any online learning platform prior to coming to college. The interviewees' final course grades were as follows: Joanna 75%, Ron 70%, Chris 68%, and Jane 80%. These grades were around the class final grade average of 72%. There was only a total of 14 students enrolled in this class.

Just like in the questionnaire, all interviewees agreed that *Help me Solve it* and *View an Example* were the most used features of MML. Although they had explored some of the multimedia components of the tool, these were not used frequently (due in part to the slow internet speed in Lebanon). Joanna noted that the MML examples (in *View an Example*) are a bit harder than what the instructor presented in class (similar to what few students stated on the questionnaire) but concluded that they are helpful since the exams' levels are similar to those of the examples. She also declared that MML can serve as a substitute for a private tutor: "Some students hire tutors but I do not see the need for it with MML." Chris also noted that some questions in MML are not covered in class but added that "this is a good

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preparation for exams." According to him, MML forces students to review the material and to be better prepared for in-class exams. Ron indicated that he was initially worried that the online component would be complicated to learn; but he later found that it is user-friendly and he liked best the *View an Example* feature. Jane was also initially worried about "having to learn a specific syntax." Later however she seemed to have explored the tool more than others; she liked the possibility for instance of generating exams, a feature not mentioned by any other student.

Students' Performances

In this section, the data collected from the web-based homework of Calculus 2 students (Spring 2013) are compared against the performance on the final exam. A special focus is placed on the interviewees above.

Students completing Calculus 2 must acquire knowledge of the following (student) learning outcomes (SLO), covered in class in the order in which they appear: SLO1-The Riemann sum and the definite integral; SLO2-The Fundamental Theorem of Calculus; SLO3-Integrations techniques (integration by substitution, by parts, trigonometric integrals); SLO4-Areas between curves; SLO5-Volumes of solids of revolution; SLO6-Exponential and logarithmic functions; SLO7-Inverse trigonometric functions; SLO8-Separable and linear ordinary differential equations. In order to gauge the effectiveness of the web-based homework, the students' performances on these homework assignments are compared to the students' performances on the final exam, particularly the problems that test the knowledge of the stated outcomes of the course. It is to be noted that the final exam is cumulative and hence assesses most course outcomes. Figure 1 below shows the class performance on the assessed outcomes on the final exam vs. the performance on the MML homework, while Figure 2 highlights in particular the 4 students' performances on these outcomes. Note that SLO3 was split into two parts: SLO3/P and SLO3/T; the former is about the technique of integration by

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parts and the latter is on trigonometric integrals; integration by substitution is a basic technique that is used in almost all integral problems and hence cannot be assessed separately. This applies as well to SLO2 and SLO6; these were indirectly assessed throughout the final exam since the Fundamental Theorem of Calculus (Part 1) is used in definite integrals, and exponential/logarithmic functions are found in many integration, differentiation, or applications problems.

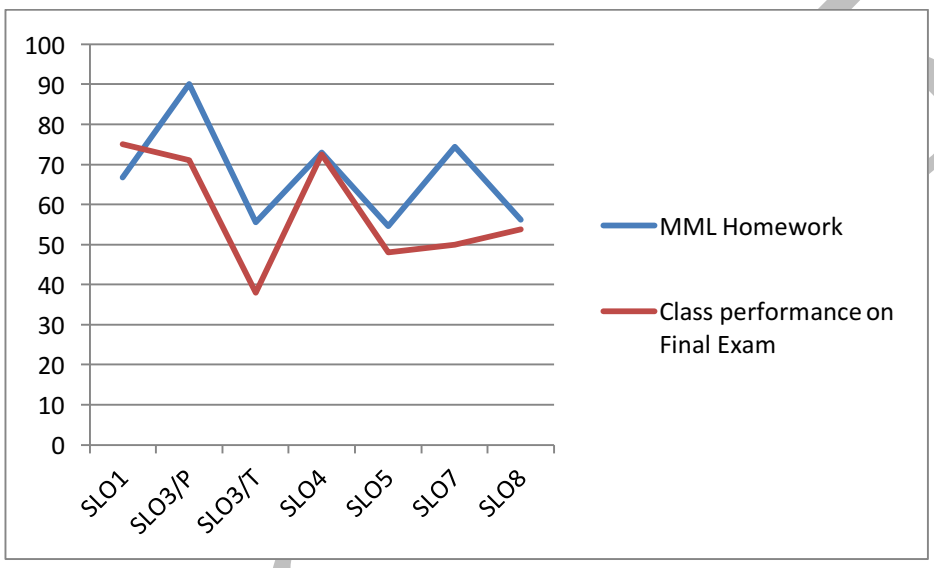
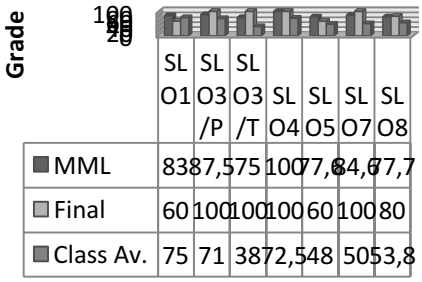


Figure 1. The class performance on the assessed outcomes in MML vs. the class performance on final exam

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Joanna



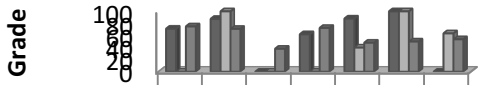
	SLO1	SLO3/P	SLO3/T	SLO4	SLO5	SLO7	SLO8
MML	83	87,5	75	100	77,8	84,6	77,7
Final	60	100	100	100	60	100	80
Class Av.	75	71	38	72,5	48	50	53,8

Ron



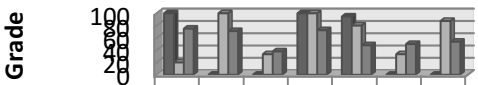
	SLO1	SLO3/P	SLO3/T	SLO4	SLO5	SLO7	SLO8
MML	83	100	75	100	55,5	84	66,6
Final	100	100	33,4	100	26,7	60	50
Class Av.	75	71	38	72,5	48	50	53,8

Chris



	SLO1	SLO3/P	SLO3/T	SLO4	SLO5	SLO7	SLO8
MML	71,2	87,5	0	62	88	100	0
Final	0	100	0	0	40	100	63,5
Class Av.	75	71	38	72,5	48	50	53,8

Jane



	SLO1	SLO3/P	SLO3/T	SLO4	SLO5	SLO7	SLO8
MML	100	0	0	100	94,7	0	0
Final	20	100	33,4	100	80	33,4	87,5
Class Av.	75	71	38	72,5	48	50	53,8

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Figure 2. Joanna's, Ron's, Chris', and Jane's performances on the assessed outcomes in MML vs. their performance on final exam and the class general average on that exam

DISCUSSION AND CONCLUSIONS

Figure 1 shows that the performance on the MML assignments is in general (except for SLO1) better than the class performance on the final exam. In fact, the mean class performance on the MML homework is around 67 while the mean class performance on the final exam is around 58. This is not a surprising result since MML allows an unlimited number of retakes and because students are using features such as *View an Example* and *Help me Solve* it. What might be interesting to observe in this figure is the alignment between the performance on the MML assignments and the performance on the final exams. In other words, if we were to connect the performances by straight lines as is the case in Figure 1, then an improvement in the MML performance is paralleled with an improvement on the final exam performance. The same is true when there is a decline in the MML performance.

Although the overall MML performance is in general better than the final exam performance, yet one may wish to look more closely at individual cases. For this, the performances of interviewees Joanna, Ron, Chris, and Jane are analysed (Figure 2). In this figure, one observes on the contrary that there are cases of better or equal performances on the final exam as compared to the performance on MML. This is found for instance in Joanna's performance on SLO3/P, SLO3/T, SLO7 and SLO8. It is also found in Ron's SLO1 and SLO4, in Chris' SLO3/P and SLO7, and in Jane's SLO4 (the cases where the MML grade is 0 is not considered because as will appear later in the discussion, there were instances where the student did not actually do the MML assignment). These observations (overall and individual) are in line with research results that have found in some cases a positive difference in grades for students using WBH assignments while other research found no significant difference.

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Can the data provided by MML be used by instructors to improve the learning opportunities of the students? To understand further the charts in Figure 2, I investigated the time spent by each student on the WBH, a feature found in MML. Studies have shown that time students spend on doing homework is related to their grades (Cooper et al., 1998; Keith, 1982; Paschal et al., 1984). Table 1 provides the average time spent per problem by every student on each MML assignment.

Joanna's MML performances on SLO1 and SLO5 ranked better than the corresponding performances on the final exam. She had consumed an average of 10 minutes per problem to complete the Riemann Sum assignment (SLO1), and an average of 9.5 minutes per problem to do the volumes assignment (SLO5). These average times are higher than the averages for SLO3/T, SLO4, SLO7, and SLO8. This could be an indication that Joanna was facing problems with these two concepts (although the highest average was 14.75 minutes per problem and it corresponded to SLO3/P in which she earned a full grade on the corresponding problems of the final exam). Ron spent a considerable amount of time completing the MML homework assessing SLO3/P (an average of 18.8 minutes), SLO3/T (an average of 14.4 minutes), SLO7 (14.5 minutes) and SLO8 (18.3 minutes) indicating again that he might be finding it difficult to complete the assignment. Indeed, his final exam performance is not only below his MML performance but also below the class average on these SLO's, except for SLO7. The observations from Joanna's and Ron's time averages *may* be used to conclude that the time spent on doing the online homework can identify the difficulties faced by the students.

We now analyse the performances of Chris and Jane. Chris earned full grades on the final exam in the sections corresponding to SLO3/P and SLO7, better than the class average. His grades on SLO1, SLO3/T, SLO4 and SLO5 are low (zero for the first three), and average on SLO8. The times spent on each corresponding assignment however are not indicative in his

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case: Whereas he spent an average of 30 minutes on SLO5 indicating that he might be facing difficulties, his time averages are among the lowest for SLO1 and SLO3/T on which his final exam grades were zero. Jane submitted fewer MML assignments than the other three; in fact she only completed the ones assessing SLO1, SLO4, and SLO5 only. In the latter 2, she performed better than the class as a whole but the corresponding time averages are higher that the time average for SLO1.The results of Chris and Jane therefore do not allow for generalizing what was observed in the cases of Joanna and Ron. What conclusions can one draw?

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	SLO1 (18 exercises)	SLO3/P (8 exercises)	SLO3/T (13 exercises)	SLO4 (9 exercises)	SLO5 (19 exercises)	SLO7 (12 exercises)	SLO8 (9 exercises)
Joanna	Average/ex.: 10m	Average/ex.: 14.75m	Average/ex.: 3.4m	Average/ex.: 4.7m	Average/ex.: 9.5m	Average/exercise: 6m	Average/ex.: 3.3m
Ron	Average/ex.: 2.5m	Average/ex.: 18.8m	Average/ex.: 14.4m	Average/ex.: 3.1m	Average/ex.: 5.1m	Average/ex.: 14.5m	Average/ex.: 18.3m
Chris	Average/ex.: 4.3m	Average/ex.: 14.25m	Average/ex.: 3.5m	Average/ex.: 10.8m	Average/ex.: 30.3m	Average/ex.: 9.5m	Average/ex.: 4.7m
Jane	Average/ex.: 14.5m	Average/ex.: N/A	Average/ex.: N/A	Average/ex.: 19.1m	Average/ex.: 25.3m	Average/ex.: N/A	Average/ex.: N/A

Table 1. Time spent by each student on every assessed SLO

Both students and instructors had mentioned that MML offers advantages and disadvantages when used as a tool for WBH. However, the advantages outweighed the disadvantages. Students noted the expansion of the learning opportunities as a result of MML tools. Instructors noted the importance of being able to monitor individual students' performances and therefore target weaknesses. The results of this study indicate that such a monitoring is to some extent useful, benefiting some students.

MML was initially introduced for assessment purposes, and the view on assessment has changed considerably in recent years. Whereas in 1999 Gretton and Challis identified grading, sorting students, and encouraging learning, as three of the main purposes of assessment, fifteen (15) years later Engelbrecht and Harding (2004) went much further and classified assessment into 4 types: The diagnostic assessment enabling instructors and learners to detect weaknesses; the formative assessment where the focus is to provide feedback to students on work they have done; the summative assessment where the main objective is to generate a numeric grade; and the accountable assessment certifying that the course students completed is at par with national or international standards. For most students, the numeric grade is the central driving force in the learning process. Therefore summative assessment is of most interest to them. Questionnaire results of this study reveal that formative assessment can also be important for students, some of whom complained about the non-detailed feedback of MML. For teachers, the diagnostic and accountable ones are more important. Informal meetings with course instructors, objects of this study, had revealed the importance of the tool for monitoring individual students' performances, hence allowing them [instructors] to target areas of deficiencies in their classes. This monitoring therefore can be in lieu of the formative assessment that the students value very much.

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In the setting of this case study, a blended type of assessment was adopted but only the WBH were to be submitted. While PPH can be used as a formative assessment by providing feedback to students on their mistakes, it was not used for that purpose since students were not asked to submit their work. Rather the PPH was used to provide students with an opportunity to enhance the learning of the material learned in class. On the other hand, the WBH was used as a summative assessment from the point of view of students, and a diagnostic assessment from the point of view of instructors. Therefore the WBH assignments could have been more beneficial and could have promoted the notion of adaptive learning had the teachers analysed the data provided by MML properly, even if such observations do not always reflect the actual learning status of the students. As Lenz (2010) stated in her conclusions, since WBH "does not appear to have a significant negative effect on student outcomes, instructors and students can enjoy the convenience and positive experience offered by such systems…" (p. 245). This is true in this case study as well. For a more beneficial experience, assistance will have to be provided for instructors to closely monitor students' performances. In this case, more solid conclusions can then be drawn specifically if a bigger, more indicative sample of students than the one used in this research, is investigated.

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Appendix – MyMathLab Student Questionnaire

This questionnaire is intended to assess the use of MyMathLab

1. The Math course that you are taking this semester, Spring 2013.

- MTH 101 - Calculus 1
- MTH 102 - Calculus 2

2. Is this your first semester using MyMathLab?

- Yes
- No

3. Approximately how many MyMathLab homework assignments have you worked on and submitted until this date?

- None
- 1-3
- 4-6
- 7-9
- 10-12
- 13 and above

4. Which of the following aids available on MyMathLab do you find most useful and/or helpful? You may check more than one answer.

- Help Me Solve It
- View an Example
- Textbook
- Calculator

5. What is your opinion regarding the time limit given for each set of homework on MyMathLab?

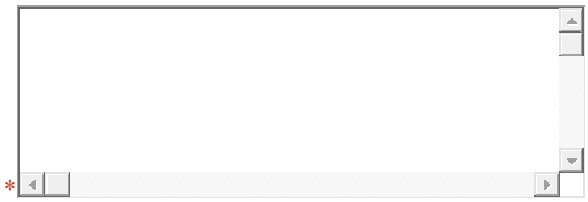
- Too short
- Just right
- Plenty of time

6. Would you recommend that quizzes be assigned on MyMathLab rather than done in class?

- Yes
- No
- Both types of quizzes

7. Please justify your answer in question 6.

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8. In general how do you rate MyMathLab?

- [ ] Useful and helpful
- [ ] Not useful or helpful
- [ ] Easy to use
- [ ] Complicated to use
- [ ] Did not use it at all

9. What is your overall assessment of a Mathematics course using MyMathLab?

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Not good

10. If you were given the choice between taking a course that requires the use of MyMathLab and another that does not, what would you choose?

- ○ Requires MyMathLab
- ○ Does not require MyMathLab

11. What is your average grade so far on the MyMathLab assignments?

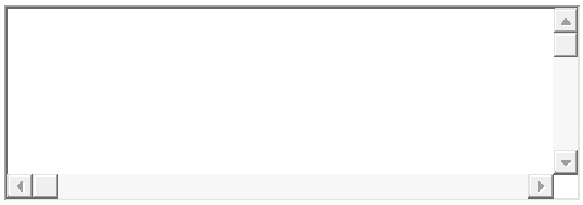
- ○ A
- ○ B
- ○ C
- ○ D
- ○ F

12. What is your estimated current grade in your course?

- ○ A
- ○ B
- ○ C
- ○ D
- ○ F

13. Any additional comments? This is an optional question.

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Entrepreneurship Education Perceptions Of Undergraduate Students In Medellin: A Case Study

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Abstract
The higher education institutions in their quest to promoting entrepreneurship in their students have implemented various strategies aimed to strengthen the entrepreneurial skills and preparation of potential entrepreneurs. However, there are still few studies focused on the perceptions and expectations of university students and the educational strategies for entrepreneurship implemented in their universities, which it is necessary to propose studies that allow detecting the needs of entrepreneurship training identified by students.

Considering the need previously mentioned, this exploratory study is presented to examine the perceptions of university students from the Economics and Administrative Sciences Departments of Instituto Tecnológico Metropolitano, Corporación Universitaria Minuto de Dios and Universidad de Medellin, about educational strategies for entrepreneurship implemented in their respective institutions. The methodology applied is quantitative approach through the application of a self-administered questionnaire to 209 undergraduate students.

Among the results, it is observed that most students consider that they require a larger training in entrepreneurship. Furthermore, they have a high level of interest to take courses related to business creation. In addition, the most frequently source reasons to not create a business by them are: not having a business idea, low economic resources and feel unprepared to create an enterprise.

Keywords: entrepreneurship education, perceptions, Medellin, undergraduate students

BACKGROUND

When the importance of entrepreneurship is embraced by educative institutions, it is becoming more common to find that the number of universities that have adapted this model and the amount of resources for entrepreneurship education programs were growing rapidly. This phenomenon can be seen as recognition of the importance of entrepreneurship, and the need for professional training is required. However, there is still no robust research framework to establish the best way to educate the future entrepreneurs (Rasmussen and Sorheim, 2006).

Furthermore, Visage (2005) affirms that entrepreneurship education has the potential to conflict with strongly point views about the role of traditional universities, but other streams explain that entrepreneurship spirit is a vital ability for any graduate (Urban, 2006). The fact is that entrepreneurship spirit should be teach and learn on the basis of an interdisciplinary approach in universities, that spirit introduces new forms of knowledge and teaching methods, as well as new abilities to solve problems and make decisions (Volkmann, 2004).

Previous conceptions show that the possible idea to drive the creation of new business and success through education are increasing. Kuratko and Katz (2005), affirm that there is increasing support for entrepreneurship as a discipline that can be taught and learned. However, regarding the implementation of entrepreneurship education, some specific problems like the difficulties in interdisciplinary design curriculum. This because of the structural rigidity and continuity of conservative professional profiles; secondly, the fact that entrepreneurship courses are offered in a disjointed form with curriculum and instructors are not adequately prepared in the area of entrepreneurship by the lack of an MSc or PhD in this field (Papayannakis, Kastelli, Damigos & Mavrotas, 2008)

That is why several researches show that the dilemma focuses on how best form to promote and facilitate academic entrepreneurship spirit within an institutional context, together with the failure not promoting barriers or lack of incentives for academics and students. This dilemma is characterize in two alternative approaches: the first one, and possibly an historical case occurs when the individual academics appropriate of entrepreneurship, as a complement to their teaching and research responsibilities. The second occurs when institutions create organizational infrastructures and mechanisms that serve to promote and manage business processes, for example, through: technology transfer offices, science parks, entrepreneurship and innovation centers (Brennan, Wall and Mcgowan, 2005).

Thus, universities can contribute to entrepreneurship indirectly, through the education of students, and directly by the commercialization of research and for being an incubator of new companies. The flow of students or "future innovators," is a great potential and a responsibility of universities to address the need for a more entrepreneurial work force and to foster a highly qualified expertise in this area. At the same time, researches carried out in universities are a source of ideas and inventions with commercial potential, being poorly utilized most institutions (Rasmussen and Sorheim, 2006)

Furthermore, although it is conceivable that entrepreneurship education is increasingly important in youth people towards entrepreneurship; yet, most of courses focused on entrepreneurship centralize their efforts on technical tasks and ignore the importance of entrepreneurial thinking, cultural limitations of entrepreneurship and individual characteristics, being the result of interaction of the individual and society. Therefore, the entrepreneurship courses should focus more on the socio-psychological and cognitive, such as self-efficacy, so students can simultaneously detect their business potential and evaluate the impact of social features and cultural concepts (Naktiyok, Karabey and Gulluce, 2010).

In this regard, it explain that more and better entrepreneurship education will positively affect the development of attitudes, abilities and intentions in students, to start new businesses, being a comparable increase in business activity. Furthermore, entrepreneurship education can have influence in the behavior and attitudes of current and future business intentions and aspirations of students (Piperopoulos, 2012). The results of recent researches indicate the importance of entrepreneurship education in promoting the entrepreneurial intention between students as the most important effect in the propensity to start a business (Ferreira, Raposo, Rodrigues, Dinis and do Paço, 2012).

Therefore, education and training must focus themselves on changing personal attitudes more than knowledge, since the effects could be more significant for the process of business creation, and to, overcome perceived barriers to entrepreneurship spirit. Educational systems need to be oriented to emphasize the value of entrepreneurship in order to promote an enterprise culture, and for this, the methods of teaching entrepreneurship should also be further explored (Ferreira et al., 2012).

Toward this, it is appropriate to conduct an analysis of the education contribution to foster entrepreneurship spirit. Business education based on sound learning theory can help to improve knowledge management and the promotion of psychological attributes associated with entrepreneurs (Ferreira et al., 2012).

In this regard, it affirms that education programs on entrepreneurship can significantly modify the entrepreneurial intentions of the participants (Rasmussen and Sorheim, 2006). About, several authors as Fayolle, Lassas-Clerc, Whitcanack and Krueger indicate that

identifying action opportunities and having confidence in personal abilities to implement a business can be improved through education and training. In addition, the evidence suggests that people with more education are more likely to exercise the entrepreneurship spirit (Urban, 2006)

On this subject, entrepreneurship education should foster the ability of imagination, flexibility, creativity and autonomy as basic competences to start and manage a business (Byabashaija and Katono, 2011). About this, it is evident than, main objectives focused on entrepreneurship education programs in the following: i) inspire students to see themselves like entrepreneurs through the development of tacit knowledge, abilities and comprehension and judgment. ii) Shaping a learning environment in which students will learn how to evaluate ideas using specific methodologies and instruments and iii) supporting to potential entrepreneurs through specific structures to make reality their ideas (Papayannakis et al., 2008)

In the same line, research show that individuals who are familiar with business and its procedures of implementation and starting, are more prone to act on opportunities and aspirations, that those who have no experience or business ideas. Which it is why education on entrepreneurship with the capabilities of students have a role in the capacity development and the promotion of an entrepreneurial culture (Frank, 2007).

Other factors and criteria used by academics to evaluate business programs include: seeking alternatives funding, flexible organization, interaction with the environment, integrated entrepreneurial culture, adaptation to user needs, use of information technologies, training of human resources, and others (Kuratko, 2005)

It is set out several principles for designing an educational program to entrepreneurship, which help to create a learning environment for students. This, in terms of their support for autonomy, self-efficiency, independent thinking, and other principles. In this sense, it is recommend allowing students developing their own learning objectives. Deduce the content to be cover due to learning problems, identified by students, designing activities that require interaction and socio-cognitive conflict, ensuring a flow of information in the classroom by all, not to show how to solve problems, and not to say that an answer is correct or incorrect, and others (Löbler, 2006).

Supporting the importance of these programs, it has found that university education has a vital impact on the empowerment of students, becoming a business education strategy (Rasmussen and Sorheim, 2006). Therefore it is advisable for universities to adopt an approach that allows encourage the entrepreneurship spirit defining curricula contents and methods of teaching to entrepreneurship, this in line with the strategic objectives set out by each institution of higher education (Volkmann, 2004).

Indeed, incorporation of business abilities in planning curriculum requires investment of time and resources by the universities. However, the changes involved may have significant long-term benefits for the institutions (Frank, 2007).

Finally, it has evaluated that in these processes, the undergraduate students must take an active role when the construction of better academic approaches and fostering entrepreneurship was allowed (Löbler, 2006). Thus, to be aware and potentiate the impact of programs and curricula is need to know the opinion of those involved individuals in the process of supply and demand for entrepreneurship education (Urban, 2006). That is because task it will be to continue persuading students to access and trust on the tools and information that provides the academy to encourage entrepreneurship. Therefore, and it is affirmed by Plaschka and Welsch (1990) the opinion of the university community in this field, being crucial for assessing and determining new horizons in the role of the university in training qualified and motivated staff to be an great entrepreneur (Urban, 2006).

METHODOLOGY

For the development of this research, a descriptive field study was develop, based on a quantitative methodology. The study population was taken from university students from the Economics and Administrative Science Departments of Instituto Tecnológico Metropolitano (ITM), Corporación Universitaria Minuto de Dios (Uniminuto) and Universidad de Medellín (UdeM).

As part of the methodological design, it was apply a self-administered questionnaire to 209 members of the target. This population was selected through non-probability quota sampling. The questionnaire consists of 25 closed questions, 16 of them in grade 5 Likert scale. The questionnaire was applied between October and November 2014.

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The analysis of the results is descriptive. It focused on examining the perception of required knowledge to create business; most important aspects to making the decision of creating a company; perceived level of knowledge about the processes of business creation toward business creation intention; interest in taking courses related to entrepreneurship, and the reasons why respondents would not create a company.

FINDINGS

Initially it is important to mention that among students surveyed in the three Institutions of Higher Education (ITM, Uniminuto and UdeM) 40.41% revealed intention to create a business before completing their undergraduate studies, a 59.59% said have no intention to create a business. However, 68.92% of respondents considered themselves as enterprising individuals and 15.14% did not know or did not respond against this. These initial overviews of respondents show how exist a positive perception of entrepreneurship in respondents although 15.14% of respondents do not describe if possess the qualities of entrepreneurs. Furthermore, a significant entrepreneurial intention was observed. Registering a 40.41% of respondents are likely to create a company. Then the surveyed population was be divided in various sub-samples from the questions asked to identify subpopulations more likely to have enterprising intention, and how education in entrepreneurship can influence on, the propensity to create a business.

Table 1 shows the perception of required knowledge to create a company, in order of relevance. These are the aspects that are valued with great importance in business creation processes: (denoted as "very important" by respondents) financial aspects (68.13%), creation of a business plan (66.14%), innovation and technology (60.56%), marketing (52.99%), generating business ideas (52, 19%), business organization (35.86%) and management of SMEs (29.88%). Toward this, seems that the foundations of the operation of enterprises, the perceived aspects more favorable in business creation process are finance and marketing. In addition, the positive assessment of adequate strategic planning was develop for starting a business through the development of a business plan. On the other hand, it shows how important is innovation and technology, being the knowledge most valued by respondents, showing the given value to the business creation with technological and innovative component that provides added value to traditional enterprises.

Table 1: Perception of required knowledge to create a company

Knowledge required	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	DK/NA
Financial aspects	68,13%	31,87%	0%	0%	0%	0%
Creation of a business plan	66,14%	28,29%	4,38%	1,20%	0%	0%
Innovation and technology	60,56%	33,47%	5,58%	0,40%	0%	0%
Marketing	52,99%	43,82%	2,39%	0,80%	0%	0%
generating business ideas	52,19%	39,84%	7,57%	0,40%	0%	0%
Business organization	35,86%	49,40%	13,94%	0,80%	0%	0%
Management of SME	29,88%	52,19%	14,74%	3,19%	0%	0%

Source: compiled from data collected in the survey applied

Additionally, Table 2 shows the most important aspects to make the decision to start a business. In order to know the motivational factors most valued by respondents when undertake (denoted as "very important" by respondents). These aspects are having a good business idea (70.92%), accessing to financing sources (45.02%), incorporating the use of new technologies (39.44%), having advice in entrepreneurship (39.04 %), having training in business creation (38.65%), having knowledge of the market (38.25%) and professional experience (21.91%) and having the support of family and friends (17.13%). These answers show surveyed students value the business creation training as one of the aspects that lead them to starting a company. However, having a business idea and required resources to start a company, are most value by respondents.

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Table 2: Perception of the most important aspects in making the decision to start a business

Aspects	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	DK/NA
Having a good business idea	70,92%	28,69%	0,40%	0,00%	0,00%	0,00%
Accessing to financing sources	45,02%	44,62%	6,77%	2,39%	0,80%	0,40%
Incorporating the use of new technologies	39,44%	45,82%	13,55%	1,20%	0,00%	0,00%
Having advice in entrepreneurship	39,04%	44,62%	15,54%	0,80%	0,00%	0,00%
Having training in business creation	38,65%	46,22%	12,75%	2,39%	0,00%	0,00%
Having knowledge of the market	38,25%	56,97%	4,38%	0,40%	0,00%	0,00%
Professional experience	21,91%	46,61%	24,30%	6,77%	0,40%	0,00%
Having the support of family and friends	17,13%	42,63%	25,90%	9,56%	4,38%	0,40%

Source: compiled from data collected in the survey applied

Table 3 contrasts the perceived level of knowledge about business creation process toward business creation intention. In that regard, 15.14% of respondents perceived that they possess a level of knowledge "excellent" to create company, 54.98% a "good" level and 27.89% consider having a regular basis to create business. Toward this, it is important to note that exists a relationship between the level of perceived knowledge and business creation intentions, because people with a higher level of knowledge have higher percentages of business creation intention.

Table 3: Perceived level of knowledge about business creation toward the business creation intention.

What do you think is the level of knowledge about business creation processes acquired in your undergraduate program?	Do you have any business creation intention after completing your undergraduate studies?		
	Yes	No	Total rows
Excelent	7,17%	7,97%	15,14%
Good	34,66%	20,32%	54,98%
Regular	17,53%	10,36%	27,89%
Bad	0,80%	0,80%	1,59%
Very bad	0,40%	0,00%	0,40%
Total	40,41%	59,59%	100,00%

Source: compiled from data collected in the survey applied

Table 4 shows that 76.49% of respondents have worked previously, 23.51% of respondents have no work experience. In this regard, 81% of those who have intentions to create a company have worked previously, while 73% of those with no intentions of creating a business have work experience. With numbers about the work experience so close, it is not

possible to make any inference about the influence of work experience in the business creation intention.

Table 4: Work experience toward business creation intentions.

	Do you have any business creation intention after completing your undergraduate studies?		
Have you worked before?	Yes	No	Total
Yes	32,67%	43,82%	76,49%
No	6,77%	16,73%	23,51%
Total (entrepreneurship intention)	40,41%	59,59%	100,00%

Source: compiled from data collected in the survey applied

Table 5 shows that 86.59% of respondents show interest to take more courses related to business creation. In addition, 92% of those who expressed business creation intention answered that they were interested in studying more subjects related to entrepreneurship. This shows the high motivation of respondents to know more about of business creation aspects, which is one of the short-term strategies that should be implemented Institutions of Higher Education to strengthen the entrepreneurial skills of its graduates.

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Table 5: Interest in take courses related to entrepreneurship toward the business creation intention.

	Do you have any business creation intention after completing your undergraduate studies?		
If there are, more subjects related to entrepreneurship did would attend.	Yes	No	Total
Yes	36,99%	49,59%	86,59%
No	3,25%	10,16%	13,41%
Total (entrepreneurship intention)	40,41%	59,59 %	100,00%

Source: compiled from data collected in the survey applied

Table 6 shows the level of knowledge of institution's entrepreneurship unit toward the business creation intention. In this regard, was observed that 50.61% know the institution's entrepreneurship unit, 49.39% did not know. In addition, a 54.32% of those who know unit do not intend to create business, so it could seems that know entrepreneurship unit is not an aspect that has a direct influence on the intention to undertake.

Table 6: Knowledge of institution's entrepreneurship unit toward the business creation intention

	Do you have any business creation intention after completing your undergraduate studies?		
Do you know the institution's entrepreneurship unit?	Yes	No	Total
Yes	23,27%	27,35%	50,61%
No	17,14%	32,24%	49,39%
Total (entrepreneurship intention)	40,41%	59,59%	100,00%

Source: compiled from data collected in the survey applied

Finally, respondents asked by the reasons that they do not want to create a business (Table 7). The main reasons were not having business idea (15.14%), lack of financial resources (21.91%), not being prepared (19.92%). It is important to note that being consistent with the factors that motivate to undertake (see Table 2), respondents valued as so important having a good business idea, having the financial resources to start a new company and being prepared academically and professionally to create a company.

Table 7: Reasons which respondents do not want to create a business (another reason)

The main reasons were: not having business idea	Percentage
Not having business idea	15,14%
Lack of financial resources	21,91%
Not being prepared	19,92%
I don´t like	4,78%
Another reason	6,37%
Total	100,00%

Source: compiled from data collected in the survey applied

CONCLUSIONS

This research show that exists a positive perception in the surveyed students toward the idea of being an entrepreneur. Moreover, most of them are enterprising individuals, 3 out of 5 respondents expressed the intention to create a business. These results show the existing entrepreneurial potential in university students, so it is important to take advantage of this potential by offering more programs and processes to strengthen their entrepreneurial skills.

Among the sub-areas of knowledge that respondents perceived as more important to create enterprise were, financial aspects, business plan creation, and innovation and technology management. These results can guide institutions to offer short courses or training programs that strengthen the theoretical and empirical knowledge in these areas in order to potentiate indirectly the propensity to creating enterprises by its students.

On the other hand, the aspects that drive to take the initiative to create a company are, having a good business idea, accessing to funding sources. This indicates that the educational offer in entrepreneurship offered to students must to incorporate strategies for finding business ideas, assessment of entrepreneurial projects and training in access to funding for business creations, and there are vital skills that can bring them to the business creation process.

Finally, it is important to note that exists a positive relationship between the perceived level of knowledge and business creation intention, because that people with a higher level of knowledge (excellent, good and regular) reported business creation intention. This situation must be taken advantage by the Institutions of Higher Education through the implementation of educational strategies in entrepreneurship that are properly articulated with the curriculum of undergraduate programs of students in order to make it tangible its usefulness and applicability in their future professional life.

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Envıronmental Educatıon In Cyprus: New Currıculums

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Abstract
Environmental education is extremely important when it comes to protecting environment and consequently survival of life on Earth. Agenda 21 which is a big international agreement, have called for a 're-orientation' of all education towards sustainability. From this point of view, a project was launched with the purpose of developing new curriculums in Cyprus on environmental education. Through the development of innovative and technology-enhanced curriculum materials the project aimed to empower awareness of Turkish Cypriot and Greek Cypriot teachers and students on issues pertaining to the environmental problems in Cyprus, and how solving these problems can bring the communities on the island together. In the context of the project, curriculum materials were prepared and workshops were offered to teachers. By using a combination of face-to-face and online strategies, educators collaborated on developing and implementing projects and activities on environment and technology. Collaborating teachers gave opportunity to work in teams to identify specific thematic units in the areas of environment that are critical to both communities and which will serve as the focus of the professional development program. During this project, five new curriculums were prepared about environmental education and discussed with teachers.

INTRODUCTION

Environment is the aggregate of all the conditions that support living things. For this reason, environmental education has been placed at the centre of efforts to achieve sustainable development for the last several decades (Blum, 2008). The birth of Environmental Education (EE) is due to the discovery of the negative effects of human beings on the environment. The world is facing great environmental challenges in terms of climate change, water and air pollution, waste problems and diminishing biodiversity. Human beings can't continue to consume and produce at the rate they are doing now, as human population continues to grow (Caldeira *et al*., 2003).

As if, *there is only one world*, the only way to escape from this chaos is to be more compatible with the natural environment which we are a part of and this may give a possibility to improve the quality of life. Thereafter, one of the most important ways of doing this is through EE. EE and Sustainability were brought to the forefront of global importance by the *Earth Summit* held on June 3rd-14th in Rio de Janeiro, Brazil. This global conference held on the 20th anniversary of the first international Conference on the Human Environment,

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Stockholm 1972, brought together policy makers, diplomats, scientists, media personnel and Non-Governmental Organizations. The goal of the conference was to help Governments rethink economic development and find ways to stop the destruction of irreplaceable natural resources and pollution of the planet. At the end of the conference 5 basic documents were produced namely; Rio Declaration, Agenda 21, Forest Principles, Climate Change Convention and Biodiversity Convention. Agenda 21 outlined what nations should do in the 21s Century to achieve sustainable development. Agenda 21 which is one of the most important international agreements have called for a "re-orientation" of all education towards sustainability (UNCED, 1992). If human beings want to survive on the earth, every Nations, Governments, schools and teachers must make it a priority to create an environmental ethos within our educational institutions. Therefore, a project entitled as Inter-communal Teacher Professional Development on Environmental Education and Technology Integration (ENVETI) was carried out in Cyprus to condense on this issue.

PROJECT OVERVIEW

The project was focused on two critical areas: environmental education and technology integration. Only the activities about environmental education were evaluated in this review. The purpose of the project was to improve pedagogical understanding of how different aspects of peace and reconciliation, including emotional and social dimensions, can be promoted through environmental education. Through the development of innovative and technology-enhanced curriculum materials the project aims to empower awareness of Turkish Cypriot and Greek Cypriot teachers and students on issues pertaining to the environmental problems in Cyprus, and how solving these problems can bring the communities on the island together. By using a combination of face-to-face and online strategies, educators collaborated on developing and implementing projects and activities on environment and technology. Three partners were collaborated in this project:

1) Management Centre of the Mediterranean (http://www.mc-med.org). A Turkish Cypriot NGO with focus on consulting, training and research services to the community.

2) CARDET - Centre for the Advancement of Research and Development in Educational Technology (lead partner) (http://www.cardet.org). A Greek Cypriot NGO with focus on research and development in education.

3) UNESCO Chair on Cultural Diversity and Intercultural Dialogue for a Culture of Peace at Intercollege (http://www.intercollege.ac.cy).

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The general goals of the project were to:

1) Raise environmental awareness among primary school teachers and students;

2) Establish an education portal for in-service and pre-service primary school teachers professional development on environmental education and technology integration;

3) Encourage the collaboration among teachers and students in the area of environmental preservation from both communities through the use of information and communication technologies;

4) Develop a sustainable model for continuous dialogue between the two communities by using technology to link schools, teachers, students, and experts.

FINDINGS

Project Activities

The project was launched in June 2014. In the context of the project, curriculum materials were prepared and workshops were offered to teachers. The workshops and all material were given for free to participating teachers. Members of the ENVETI team worked with experts on environmental education and technology integration who collaborate with the teachers and the development team in preparing modules, lesson plans, and sample activities targeting environmental education. During this project, five new curriculums were prepared about environmental education and discussed with teachers.

Curriculums

During the two years, five different curriculums were prepared on three topics. The subjects are as follows:

1) Nature and Wildlife
2) Pollution
3) Nature and Wildlife (2)
4) Organic Farming
5) Pollution (2)

For all curriculums, five different lesson plans were prepared. Curriculums were supported with a *central question, general objectives, main ideas, key terms, materials needed,*

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activities, assessment, possible extensions and *resource bibliography*. For all lesson plans, *activities* were prepared to cover 120 minutes duration.

Curriculum 1: ***Nature and Wildlife***

This module aims to educate children about the nature and wildlife in order to teach them to love and protect their environment. To reach this goal: rather than books, words or learning all the facts, the children must relate to nature as a source of wonder, joy and awe. For this reason, this module will be based on the sense of wonder and the joy of discovery by including series of activities and tasks. The lesson plans of this curriculum were given in Table 1.

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Table 1. Short Description of the Lesson Plans of the Curriculum *Nature and Wildlife*

Lesson Plan	Short Description
Lesson Plan # 1: Respecting Living Things	This lesson plan was prepared to answer the question of *"Do human beings are owners of the world?"*. This aimed to enhance students' awareness on other living things which share the earth with human beings. This lesson also intended to support students' understanding that human beings can not survive without other living things
Lesson Plan # 2: Recognizing Ecosystems and Natural Resources	The central question of this lesson plan was *"What are ecosystems?"*. General objectives of this lesson was to support students' understandings of what are ecosystems, why are they important for us, what kind of ecosystems exist on our earth and what are the differences between these ecosystems? An ecosystem is a naturally occurring assemblage of organisms (plant, animal and other living organisms: "biotic") living together in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem always functions as a whole unit but can be of any size-a log, pond, field, forest, wetland, or the earth's biosphere. In an ecosystem living things depend on each other and their surroundings and also adapt to their habitats. And human beings usually forget that they are among the living things. Therefore, this lesson aimed to cause children to remember it.
Lesson Plan # 3: Conserving Ecosystems and Natural Resources	Recognizing ecosystems and natural resources alone is not a big thing; the important point is to conserve them. Therefore, the big idea of the lesson was to educate children about the reasons of protecting ecosystems and how can we do this?
Lesson Plan # 4: Biodiversity and Human	The aim of this lesson plan was to educate children about the interactions between biodiversity and human beings. So, it was tried to answer the question of *"Does the threat on biodiversity affect human beings (How)?"*. Followings are some of the objectives of this lesson plan: ⇨ Support students' understandings about the biodiversity and its importance? ⇨ Support students' knowledge on the biodiversity and endemic species of Cyprus? ⇨ Support students' understandings about the projects that are likely have adverse effects on the biodiversity and why some species are in danger of disappearance? ⇨ Support students' understanding of why do we care endanger species and why endemic species need more care than other species? ⇨ Support students' understanding of what happens if one species disappear? ⇨
Lesson Plan # 5: Sense of Wonder and Joy of Discovering	The main idea was to support first 4-lessons with a bi-communal activity. So as to do, a bi-communal trip was suggested to be organized to a known, ecologically important wetland ecosystem (or different type of ecosystems; forest, mountain, etc.) and let students to see the interactions between living and non-living things. This would increase the awareness of students and show the realities to them by relating them to nature as a source of wonder, joy and awe.

Curriculum 2: *Pollution*

This module aims to support student learning about air, water and soil pollution for the purpose of in order to get an environmentally literate population. In this case, curriculums were prapered cover information about the contaminants (both for air, water and soil), environmental protection and pollution prevention measures. For this reason, this module based on the real-life scenarios and the development of possible solutions for certain problems. The lesson plans of this curriculum were given in Table 2.

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Table 2. Short Description of the Lesson Plans of the Curriculum *Pollution*

Lesson Plan	Short Description
Lesson Plan # 1: Learning about the Contaminants	This lesson plan covers information about contaminants of the air, water and soil. General objectives of the lesson were determined as to enhance students' awareness on the contaminants polluting air, water and soils which are the cornerstone of life on the earth and to support the development of students' understanding on the negative effects of contaminants on the environment.
Lesson Plan # 2: Environmental Protection for our Common Well-Being	This lesson aimed to give some more information about the reasons of environmental protection. Climate Chance which is among the most important environmental problems and caused by pollution were given as an example of negative effects of pollution. The term of Climate Change is commonly used interchangeably with "global warming" and "the greenhouse effect," but is a more descriptive term. Climate change refers to the buildup of man-made gases in the atmosphere that trap the suns heat, causing changes in weather patterns on a global scale. The effects include changes in rainfall patterns, sea level rise, potential droughts, habitat loss, and heat stress. The greenhouse gases of most concern are carbon dioxide, methane, and nitrous oxides.
Lesson Plan # 3: Trip to Cyprus Mining Corporation - CMC Area	This lesson was planned to be like a trip to Cyprus Mining Corporation Area. This a huge environmental problem in Cyprus and can be a good example of *"why do we have to protect environment?"*. Therefore, general objectives can be accepted as to support students' understanding on the negative effects of contaminants and enhance students' awareness on the protection of environment.
Lesson Plan # 4: Preventing Pollution	This lesson aimed to give information about how can human beings prevents pollution formation. There is no pollution in ecological balance, so it is because of the effects of human beings. And this leads us to be hopeful that we can prevent pollution by changing our activities with alternative, environmental activities. Therefore, this lesson included some important activities to achieve that goal, such as alternative transport.
Lesson Plan # 5: Ecological Farming	Agricultural pollution is among the important pollution types. Moreover, ecological farming is one of the important activities to achieve that goal. Therefore, this lesson aimed to give some information about this alternative, environmental and healthy farming system where chemical pesticides, fertilizers, Genetically Modified Organisms (GMO) and other harmful things are not allowed in ecological farming.

Curriculum 3: ***Nature and Wildlife (2)***

After the preparation and discussion of curriculum 1 (Nature and Wildlife) with the teachers, it was seen that this subject is so important and another curriculum was prepared for this topic. The aim of this module was similar with first curriculum, but it was specified on soil, soil erosion, plants role in wildlife, water and the atmosphere. The lesson plans of this curriculum were given in Table 3.

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Table 3. Short Description of the Lesson Plans of the Curriculum *Nature and Wildlife (2)*

Lesson Plan	Short Description
Lesson Plan # 1: Soil	The aim of this lesson was to give some information about soil formation and to aware children that soil not just soil!, it is a living thing. Soil is formed from the weathering of rocks and minerals in which the processes of formation happens over a very long period of time, it can take 1000 years or more. The soil is not just a substrate where plants grow, it is a living entity. A living soil is teeming with life, from earthworms, centipedes and beetles to fungi and bacteria. Healthy soil has food, air and water to help plants grow. Therefore, human health is interrelated with soil health.
Lesson Plan # 2: Soil Erosion and Wildlife	The aim of this lesson was to inform children about the negative effects of soil erosion. It is aimed to support students' understanding that everything on the earth are depend upon each other and to support students' understandings on the negative effects of erosion. Everything on the earth is dependent each other and all are dependent with soil. Soil, which takes thousands of years to be formed, is easily destroyed by erosion and this negatively affects all life on the earth.
Lesson Plan # 3: Plants Role in Wildlife	This lesson plan aimed to give information about the roles of plants in wildlife and life. Plants supply food to human beings and animals, many of them are used as medicine, they have important functions in biological cycles, protect soil and etc.
Lesson Plan # 4: Water and Human	This lesson was prepared to cause children to re-think the importance of water. General objectives of the lesson were to support students' understandings on the functions and necessity of water and enhance students' knowledge about water protection.
Lesson Plan # 5: Atmosphere and Human	The last lesson of the curriculum Nature and Wildlife (2) aimed to give information about atmosphere and make a concluding discussion about the interaction with natural resources.

Curriculum 4: *Organic Farming*

The aim of this curriculum was to inform children about the new farming system: organic farming. The reason of the preparation of this module is that organic farming and organic products are becoming very important and widely used in 20th century and children should be educated about this issue. Organic farming is very important for human health and ecosystems, and children do not know much information about it. Throughout the 1950s, the main aim of farming was to achieve a major improvement in productivity so as to satisfy immediate needs for food. However, to increase the productivity of crops, excessive chemicals were used unconsciously. In long time, these damaged the environment and degreased the productivity. In the circumstances, organic farming was obviously unlikely to be viewed very favourably. However, by the end of the 1960s, and especially in the 1970s, organic farming came to the forefront in response to the emerging awareness of environmental conservation issues. Organic farming can be defined as an approach to agriculture, where the aim is to create integrated, humane, environmentally and economically sustainable agricultural production systems. The main aim of organic farming is to protect long term fertility of soils and conservation of wildlife and natural habitats. The lesson plans of this curriculum were given in Table 4.

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Table 4. Short Description of the Lesson Plans of the Curriculum *Organic Farming*

Lesson Plan	Short Description
Lesson Plan # 1: Negative Effects of Conventional Farming	Before giving information about organic farming, it is important to give some information about the negative effects of conventional farming which leads the birth of organic farming. General objectives can be summarized as: enhancing the awareness of children about the negative effects of conventional farming and supporting the understanding of the children about the necessity of organic farming.
Lesson Plan # 2: The Birth of Organic Farming	This lesson plan was prepared to inform children about the birth of organic farming and its concept.
Lesson Plan # 3: Principles and Rules of Organic Farming	This lesson plan was prepared with the aim of informing children about the rules and principles of organic farming and ensures the recognition of organic products by the children. One of the most important features of organic farming is that, organic farms are controlled by special organizations and the products are being certificated as organic. Products without a certificate are not accepted as organic product.
Lesson Plan # 4: Natural Systems and Organic Farming	Most of the critics about organic farming are condensing on the idea of *"crops can not be produced organically"*. Therefore, this module designed to make a bridge between natural systems and organic farming. This is because, natural systems continue to work perfectly without the activities of human beings which means that crops can be produced organically. Such as, in natural systems, wastes of some plants become nutrition for other plants. And, in organic farming, compost which is made from plant and animal wastes are being used as a fertilizer for the plants instead of chemical fertilizers.
Lesson Plan # 5: Organic Farming for Sustainable Life	This lesson plan was aimed to strengthen first 4 lessons with a trip to an organic farm. This is to show the realities about organic farming and increase the awareness of children on the benefits and necessity of organic farming and organic products for sustainable life.

Curriculum 5: *Pollution (2)*

This module aims to support student's knowledge about pollution and waste management. This curriculum focused on effective waste management practices through a series of activities and tasks. General objectives of this curriculum can be summarized as: to support student understanding of the concept of waste, effective waste prevention and effective waste management practices. The lesson plans of this curriculum were given in Table 5.

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Table 5. Short Description of the Lesson Plans of the Curriculum *Pollution (2)*

Lesson Plan	Short Description
Lesson Plan # 1: Learning the Concept of Waste	One of the most important mistakes done by human beings is to suppose that "all of the things that their duty has gone are waste". However, this is not. Everything that we throw out is not waste, waste are object or materials for which no *use* or *reuse* is intended. From this point of view, this lesson plan objective to enhance students' awareness on the meaning of waste and to support the development of students' understanding on the other usage areas of objects and/or materials.
Lesson Plan # 2: Negative Effects of Wastes	After the identification of waste, it is important to educate children about the negative effects of waste. This is because many of human beings do not know the negative effects of wastes. Wastes are not only polluting environment and causing bad smell, they cause many environmental problems such as: deterioration of soil, threats on plants, threats on animals (especially small soil organisms), polluting atmosphere, polluting water and etc.
Lesson Plan # 3: Important Steps of Waste Prevention	Waste problem is not an unsolvable thing; it is on the hand of human beings can easily be managed. With this perspective, this lesson plan was aimed to give information about waste prevention which is the first step of waste management and it is easier than to the other things.
Lesson Plan # 4: Important Steps of Waste Management	This lesson plan was prepared to give information about the steps of waste management, such as: reuse, reduce, recycle, composting and etc.
Lesson Plan # 5: Cleaning of The School Environment	Like the other curriculums, the last lesson of this curriculum was also aimed to strengthen first 4 lessons with an activity. For this purpose, a cleaning activity was supposed to be carried out with students. The main aim of cleaning activity is to increase the awareness of children about the causes of wastes and importance of cooperation in waste management.

CONCLUSION

Collaborating teachers gave opportunity to work in teams to identify specific thematic units in the areas of environment that are critical to both communities and which will serve as the focus of the professional development program. Teachers from both communities worked in groups and collaborated with experts to identify specific environmental issues that both communities face. They then shared and discussed their findings online and face to face and identified common themes. They also developed lesson plans on environmental education that would be implemented in classrooms in both communities. During this project, five new curriculums were prepared about environmental education and discussed with teachers.

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Etmen Tabanlı Uçuş Eğitimi Uygulaması

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Abstract
Looking at the development of computer systems in recent years, software model of the day by the central work of the model is introduced to distributed work model. This development is located by finding the classroom-based teaching in the field of education has led to the development of complementary space independent educational software. These software were used in artificial intelligence and agent technology for work smarter and more coordinated. Thus, these intelligent systems designed, distributed interactive working environment can be made in one of the many operations and decision-making autonomy, independent problem-solving skills that are gained.
In this study, the implementation of distance education technology training software agent-based architectures have been investigated. The use of this technology in flight training recommendation of the agent-based method is evaluated on the ability to provide such training.
Keywords: Distributed systems, intelligent agent technology, distance education, flight training.

GİRİŞ

Eğitim; okullar, kurslar vasıtasıyla bireylere hayatta gerekli olan bilgi ve kabiliyetlerin önceden saptanmış esaslara göre insanların davranışlarında belli gelişmeler sağlamaya yarayan planlı etkiler dizesidir. Gelişen bilgisayar teknolojisi beraberinde yenilikleri getirmiştir. Bilgisayar teknolojisinin, haberleşme ve iletişim sağlama amacı ile oluşturulan internet ağını da kullanması, eğitimi uzaktaki insanlara taşıma olanağını sağlamıştır (İşman, 2011).

Her alanda olduğu gibi eğitimde de yeni teknolojilerle paralel olarak gelişen, geleneksel eğitimden farklı, mekân ve zaman sınırlanmasından uzak gelişmeler sağlanmıştır. Web tabanlı uzaktan öğretim uygulamaları, öğretmen merkezli eğitim sisteminden öğrenci merkezli bir öğretim sistemine geçişi ifade etmektedir. Bu açıdan bakıldığında, nesnelci öğretimden oluşturmacı öğrenme yaklaşımlarına doğru da bir anlayış değişikliğinin meydana geldiği söylenebilir (Distance Education, 2003). Uzaktan eğitimde bu durum öğrencinin öğrenecekleri şeye kendilerinin karar vermesi ve yaşadıkları deneyimler üzerine kendi öğrenecekleri konulara yoğunlaşmalarını sağlayan bir yapı söz konusudur. Bu karar verme yapısı yapay zekâ ve etmen tabanlı yazılımlar ile sağlanmaktadır (Distance Education, 2003; Dağ, 2011)

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Son yıllarda üzerinde yoğun çalışılan yapay zekâ teknikleri, bilgisayar destekli karar yazılımlarına yeni bir boyut getirmiştir. Yapay zekâ çalışmalarının temel amacı; insan gibi düşünüp yorum yapabilen, çıkarımlarda bulunup karar verebilen bilgisayar programları oluşturabilmektir. Geliştirilen bilgisayar programlarına bakıldığında geleneksel yapay zekâ tekniklerinin yanında 1980'lerden bu yana geliştirilmiş olan etmen tabanlı yazılım mimarilerinin de yer aldığı görülmektedir.

Geleneksel bilgisayar temelli öğretim sistemlerinin ana problemlerinden biri, her öğrenciye uygun öğretim yönteminin nasıl sağlanacağıdır. Tasarlanan sistem mümkün olduğunca öğretmenden beklenen rolleri karşılamaya yönelik olmalıdır. Her öğrenci için yapılandırılan robot öğrenci modeli; öğrenciye uygun öğretim izlencesini adapte edebilir yetenekte olmalıdır. Sistem problem çözümlerinde ve alıştırmalarda görev başarısına destek vermeli ve ihtiyaç duyulan yardımcı kaynakları nerede olursa olsun öğrenciye sunabilmelidir. Son zamanlardaki gelişmeler zeki öğretim ortamlarının tasarımında, rol tabanlı etmen temelli mimarilerin kullanımını gerekli kılmaktadır. Çünkü çoklu-etmen mimarisi öğretim sisteminin gelişiminde çok uygun bir potansiyele sahiptir (Messina, 2013).

Etmenler, dağıtık uygulamaların yaygınlaşması ile ortaya çıkan bir konudur. Özellikle internetin dağıtık yapısı, sürekli dağıtık sistemlerin geliştirilmesi yeni teknolojilerin aranmasına neden olmuştur. Zekilik, otonomluk ve sosyallik gibi özelliklere sahip olan çok etmenli sistem, insan müdahalesi olmadan kullanıcıları adına hareket ederek kullanıcıların hedeflerini yerine getirmek ve bilgilerini birbirleriyle paylaşmak için çalışırlar (Ergün,2013; Aydın). Otonom bir etmen, bulunduğu ortamı algılar ve ona göre faaliyet gösterir, zamanla sahip olduğu programı devam ettirir ve gelecekle ilgili güncellemeleri algılama yoluyla kendiliğinden yapabilir (Long, 2014).

Eğitim için geliştirilen sistemlerde kullanılan etmenler rol ve işlevlerine göre tanımlanmışlardır. En çok bilinen eğitimsel etmenler; zeki etmenler, arayüz etmeni, asistan etmen, bilgi etmeni, değerlendirme etmeni, pedagojik etmen, tavsiye veren etmen ve uzman etmenler olarak bilinmektelerdir (Yılmaz, 2011).

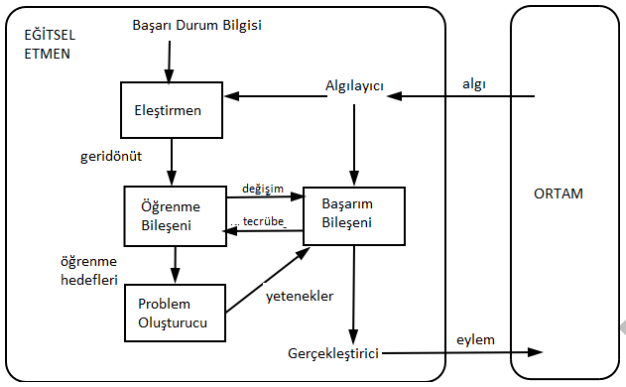
Eğitim etmeni Şekil 1 'de görüldüğü üzere dört kavramsal bileşenden oluşur.

- Öğrenme Bileşeni
- Başarım Bileşeni
- Eleştirmen
- Problem Oluşturucu

Başarım bileşeni, algılayıcılar sayesinde ortamda olan algıları alır ve eylemlere karar verir. Öğrenme bileşeni, eleştirmenden gelen ve etmenin ne kadar iyi olduğunu gösteren geri dönüt

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kullanarak, gelecekte daha iyi olması için başarım bileşeninin nasıl değiştirilmesi gerektiğine karar verir. Problem oluşturucu, yeni ve bilgilendirici tecrübelerin elde edileceği eylemlerin önerilmesinden sorumludur (Yılmaz,2011).



Şekil 1. Eğitim Etmeni yapısı.

Eğitim uygulamalarında kullanılan eğitsel etmenler görevlerine göre 7'ye ayrılırlar. Bunlar;

a) Zeki Etmen: Bulunduğu durum içerisinde kendi kendine karar verebilen etmenlerdir. Bu etmen türlerinin tasarlanması ve yazılımlarda kullanılması yapay zekâ araştırmaları kapsamında yer almaktadır. Eğitim sistemlerinin tasarlanmasında kullanılan zeki etmenler iki temel yeteneğe sahiptirler (Yılmaz,2011);

Uyum Sağlama Yeteneği: Eğitsel arayüz etmenleri öğrenme ortamına uyum sağlama yeteneğine sahip olarak tasarlanabilirler. Etmenin uyum sağlama yeteneği ile öğrenme ortamında her bir öğrencinin kişisel ihtiyaç ve tercihlerine uygun olarak eğitsel arayüz etmeni öğrenme ortamına uyum sağlayacaktır. Yani sistemin, öğrenme ortamında öğrencilerin karşılaştığı farklı problemler karşısında farklı çözüm önerileri getirebilme yeteneğine sahip olmasını sağlar.

Öğrenme Yeteneği: Zeki etmenin öğrenme yetenekleri sayesinde sistem; deneme-yanılma, gözlem yapma, kullanıcının davranışlarını analiz etme gibi yollarla öğrenmeler gerçekleştirebilir ve öğrendikleriyle ilgili olarak örnekleme ve genellemeler yapabilir.

b) Arayüz Etmeni: Eğitsel etmenin kullanıcıya görünen bölümüdür. Yani eğitsel etmenin kullanıcı arayüzüdür. Arayüz etmeni kullanıcıyla etkileşim içerisindedir ve sistemde bulunan diğer etmenler ile işbirliği halindedir.

c) Asistan Etmen: Öğrenciyle etkileşim kurarak ona yardım ve rehberlik etmekten sorumludur.

d) Bilgi Etmeni: Bu etmen bilginin sunulmasını ve bir arayüzle bilgiye ulaşılmasını sağlamaktadır.

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e) Değerlendirme Etmeni: Yazılımdaki değerlendirme araçlarını kullanarak öğrencilerin konuyla ilgili değerlendirilmesini sağlar ve elde ettiği değerlendirme sonuçlarına göre öğrencilerin profilini güncelleştirir.

f) Pedagojik Etmen: Hedef kitleye uygun pedagojik yöntem ve teknikler kullanarak, öğrencilerin konuyla ilgili içeriği etkili bir şekilde öğrenmelerine yardımcı olur.

g) Tavsiye Veren Etmen: Bu etmen, akıllı bir kişisel yardımcı olarak sistem içerisinde yer alır. Tavsiye veren ajan kullanıcının hareket ve eylemlerini izler ve gerekli bilgileri bularak konuya ilişkin önerilerde bulunur (Yılmaz,2011).

ÖNCEKİ ÇALIŞMALAR

Günümüzde yaygın olarak uzaktan öğretim uygulamalarında öğrenme ve öğretme amaçlı web kullanımı artmakta ve bu amaçla birçok ülkede üniversitelerde geleneksel sınıf-temelli öğretimi tamamlayıcı yazılımlar geliştirilmektedir. Bu yazılımlarda sistemin daha zeki ve koordineli çalışması amacıyla yapay zekâ teknikleri, uzman sistemler ve etmen teknolojilerinden yararlanılmaktadır. Böylelikle tasarlanan yeni zeki sistemler, dağıtık birçok işlemin bir arada yapılabildiği, etkileşimli bir çalışma ortamı ve karar verme özerkliği olan, bağımsız problem çözme yeteneğine sahip sistemlere dönüştürülmektedir (Alaybeyoğlu). Aşağıda dünya genelinde değişik ülkelerde tasarlanan ve farklı alanlarda uygulamaları yapılan bu çalışmalardan bazıları incelenmiştir.

A. Uzaktan Eğitimde Etmen Temelli Bir Yaklaşım

Bu sistem etkin olarak web üzerinde çalışan etmen temelli bir mimari ile geliştirilmiştir. Web üzerinden sunulan yeni olanaklar kullanılarak, ağ araçları yardımıyla etkileşimli bir eğitim ortamında öğrencilerin bir araya geldikleri sanal bir öğrenme ortamı tasarlanmıştır (Leung, 2001).

Eğitime destek amaçlı tasarlanan bu sistemin fonksiyonları genel olarak öğrencilerin kurs materyalleri, çalışma programları, tartışma formları ve audio-video ders materyallerini kendi bilgisayarlarına indirip kullanmaları üzerine odaklanmıştır. Ders materyalleri web üzerinde herhangi bir siteden HTML formatında veya grafik, ses ve video biçimindeki saklanmaktadır. İlgili bağlantılar yardımıyla başka bilgisayarlardaki değişik biçimlerdeki bilgilere de erişilebilmekte ve gerçek derslerde daha önceden hazırlanmış materyallerden de serbestçe yararlanmak mümkün olmaktadır (Leung,2006). Planlanan e-öğrenme sisteminde, üç katmandan oluşmaktadır; İstemci, Web Sunucu ve SQL Veritabanı. Bu üç katman bir makine veya farklı makineler üzerinden ağ üzerine dağıtılabilir.

Tasarlanan sunucu mimarisi ise altı etmenden oluşur. Bunlar; ev-temelli öğretim, personel profilleri, değerlendirme, dinamik çalışma planı, kurs ve çalışma materyali planlama ve ev-

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temelli öğrenme aracılarıdır. Ayrıca öğrenme ve öğretme faaliyetleri için bir veri deposu, e-öğrenme sistemini desteklemek ve ileride elde edilen verilerden veri madenciliği ile anlamlı örüntüleri çıkarabilmek için kullanılmak üzere saklanan verilerdir (Leung, 2001; (Leung, 2006).

B. Çoklu, İşbirlikçi ve Zeki Etmen Temelli Bir Yaklaşım

Bu çalışma, etmenlerin dersler arasındaki bilgilerinin karşılıklı değişimi yöntemi ile çoklu ders işbirliğini desteklemede yeterince başarılı olacağı öngörülmüştür. Modellenen bu süreç oldukça karmaşık bir yapıdır ve bu sebepten dolayı birçok kolaylaştırıcı yönü tespit edilerek prototipi geliştirilmiş, böylelikle tam göstergeli, çok konulu, işbirlikçi bir öğretim deneyimi gerçekleştirilmiştir (Solomos, 1999;Taylor, 2012).

Bu çalışmada çok etmenli öğrenme sistemi (ÇES) tanımlanmış ve uzaktan öğrenmedeki uygulamaları tartışılmıştır. ÇES, bir öğrenci ve birçok öğretmenin öğrenme durumlarının modellendiği bir örnektir. Her bir ÇES etmeni, bir konunun uzaktan öğretimini yapabilecek yeteneğe sahiptir. Her etmen bir dersi temsil eder. Aynı zamanda bu etmenler öğrencilerin karşılaştıkları öğrenme zorluklarını çözümlemek için birbiriyle işbirliği içerisindelerdir. Bu etmen yapılı mimaride, öğrenme görevlerinin yerine getirilmesi için paylaşım temelli bir altyapı tasarlanmıştır. ÇES, sistemde yer alan heterojen öğrenme nesnelerinin işbirliğini desteklemek üzere kullanılmıştır (Taylor, 2012).

Çalışmada tasarlanan etmenler, bir aracı sisteminin diğerleriyle iletişim kurduğu ve birlikte hareket ettiği, akıl yürüten, algılayıcı ve aktif yazılım bileşenlerini içerir. Etmenler normal bir öğretim sisteminin kabiliyetlerine ilaveten diğer etmenlerle iletişim yeteneklerine sahip, işbirliğini internet üzerinden sağlayacak kadar da kapsamlıdır (Solomos, 1999; Taylor, 2012).

C. Etmen Tabanlı Modelleme ve Simülasyon

Her eğitimin bir teorik, bir de uygulama yönü vardır. Bilgi ve uygulama birbirini tamamlayan çalışmalar olarak ele alınmalıdır. Günümüz eğitim anlayışında buna oldukça önem verildiğini görülmektedir.. Bazı alanlarda bilgiden çok, bu bilgilerin nasıl uygulanabileceğini göstermek çok daha önemli olmaktadır. Bu anlamda uygulamalı teknik bilimlerde en çok kullanılan uygulama yöntemi olan simülasyon eğitimlerinin oldukça faydalı olduğu gözlemlenmektedir. Bu alanda yapılan çalışmalar incelenmiştir.

Hocaoğlu ve arkadaşları (2011), çalışmalarında etmen tabanlı simülasyon sistemlerinin (ETSiS) desteklediği çoklu programlama paradigması ile yazılım mühendisliğinin tekrar kullanılabilirlik, esneklik, işletilebilirlik ve ortogonallik kriterlerini sağlama yaklaşımı ile modelleme ve simülasyon çözümü, model tabanlı test yöntemi ile birleştirilerek bir doğrulama geçerleme süreci önerisi sunmuşlardır. ETSiS(AdSiF) olarak isimlendirilen sistem,

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modelleme ve simülasyon çerçevesi matematiksel nesnelerin betimlenmesi için bildirimsel bir metot sunar. Temelde bir sistem; zamana, girdilere, durumlara, davranışlara ve sistem dinamik karakteristiğini yöneten bir mekanizmaya sahiptir. Bu sayede, ETSiS simülasyon uygulamaları için oldukça esnek ve güçlü bir geliştirme ortamı sunmaktadır. [AdSiF: Agent Driven Simulation Framework And Model Based Validation And Verification] (Hocaoğlu, 2011).

Polat (2010), çalışmasında etmen tabanlı modelleme ve simülasyon yaklaşımı ile harekat modellemesi özellikle insan faktörünün harekata etkisinin modellenmesinde ciddi kolaylıklar sağladığını belirtmektedir. Mevcut kabiliyet kapsamında birçok taarruz ve savunma görevleri modellenebilmektedir. Etmen modeli esnek ve kolay genişletilebilir bir yapıda olması sebebiyle yeni birliklerin aktör yapıları, icra edecekleri görevler ve durumsal farkındalıklar kolaylıkla tanımlanabilmektedir (Polat, 2010). Literatüre bakıldığında bu konuda çalışmış oldukça çok benzetim çalışmaları vardır (Gimeness, 2008; Jones, 1999; Pechoucek, 2009; Weijun, 2008).

ÖNERİLEN MODEL

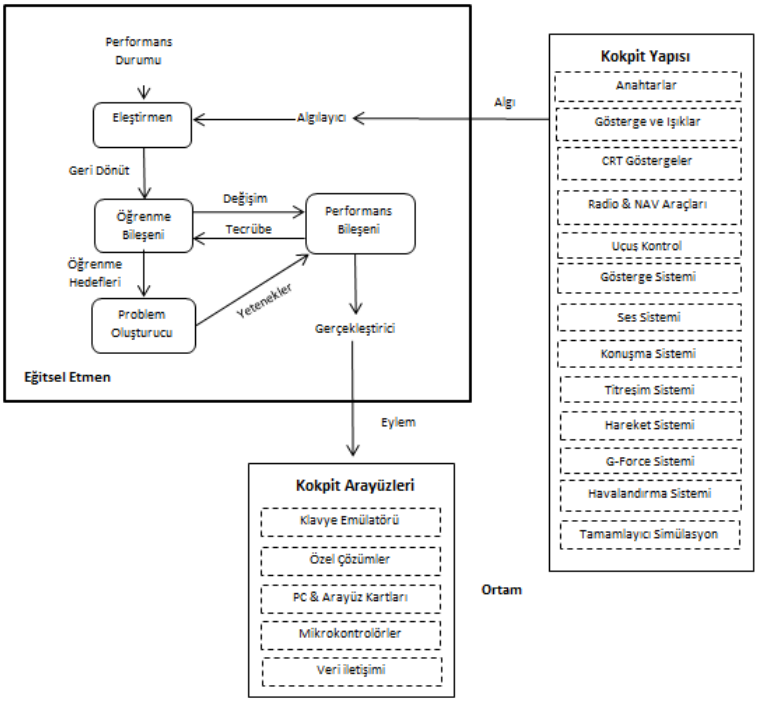
Dağıtık yapay zekâdan türetilen etmen teknolojisi, karmaşık ve dinamik durum değiştiren platformlardaki problemlerle başa çıkmak ve dağıtık uygulama ortamlarına uyarlama konusunda kolaylık sağlamaktadır [13, 23]. İncelenen çalışmalarda, öğrencilerin sanal öğrenme ortamlarında kendilerine rehberlik ve kılavuzluk edecek, kendilerini yönlendirecek, dikkatlerini öğrenme ortamı üzerinde toplayacak, kendilerini cesaretlendirecek, alıştırma ve uygulamalarda ipuçları, dönütler, hatırlatmalar vb. vererek öğrencileri destekleyecek, öğrenme ortamında kendilerine eşlik edecek, iyi vakit geçirmelerini sağlayacak yazılımla ilgili nesne veya materyallere ihtiyaç duydukları belirlenmiştir. Bu ihtiyacın ise eğitim yazılımlarında eğitsel etmen ile oldukça başarılı şekilde giderilebildiği düşünülmektedir.

Bilgisayar teknolojisindeki gelişimler, gerçek hayatta gerçekleştirilmesi riskli ve maliyetli olan eğitim süreçlerinde kullanılarak, öğrencilerin eğitim, hazırlık ve bilgi düzeyi analizinde kullanılabilecek uygulamalar geliştirilmesini sağlamaktadır. Teknolojinin en yoğun ve karmaşık olarak kullanıldığı alanlardan biri havacılık sektörüdür. Eğitimleri oldukça riskli ve maliyetlidir. Bu çalışmada, uçuş eğitimlerinde sanal öğrenme ortamlarının kullanılmasının faydaları ele alınarak, bu eğitimlerde etmen tabanlı sanal gerçeklik uygulamalarının kullanılması önerilmektedir.

Önerilen sistemde, önceden belirlenmiş prosedürler dahilinde bir pilot adayının uçağı uçuş durumuna getirecek kokpit bölümünü eğitimleri yer almaktadır. Bu prosedürler motorun çalıştırılmasından, uçağın kalmasına ve uçuş sırasında yapılması gereken kontrollerin hepsini

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kapsayan bir listedir. Eğitim sırasında bu prosedürlere bağlı kalarak pilot adaylarının Şekil 2'de görüldüğü gibi kokpite ve uçuşa intibak sağlamaları hedeflenmektedir.



Şekil 2. Önerilen sistem modeli

Önerilen sistemin amacı, Şekil 3'te görülen bilgisayar destekli görsel üç boyutlu kokpit ve uçuş simülasyonu uygulaması ile pilot adaylarının simülasyon eğitimine tabi tutularak adaptasyon sürelerini azaltmaktır. Bu simülasyon çalışması tamamen eğitime yönelik ve maliyeti düşürme amaçlıdır. Şu anda uçuş simülasyonu olarak kullanılmakta olan Microsoft Flight Simulator vb. uygulama yazılımları mevcuttur. Bu uygulamalar gerçeğine yakın uygulamalardır (Microsoft Flight Simulator X). Önerilen sistem de piyasada bulunan sistemlere benzemektedir, ancak etmen mimarisi kullanılarak öğrenciye ve sisteme ait durumları kendisi algılayan ve ona göre benzetim modeli sunan bir sistemdir. Bir etmen, bulunduğu çevre içerisinde var olduğu sürece, kendisi için tanımlı olan olaylara ve durum değişimlerine göre reaksiyon gösterir. Bu reaksiyonlar ile pilot adayının içinde bulunduğu durum ve bilgi seviyesi ölçülerek kişiye özel eğitim modellemesi sağlanır.

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Şekil 3. Simülasyon Kokpit ve Uçuş Görüntüsü

SONUÇ

Zeki etmen mimarisi, karmaşık problemlerinin çözülmesi için önemli bir potansiyele sahiptir. Dağınık aktiviteleri web ile ilişkilendirilmiş dağıtık yapay zekâ sistemleri sayesinde bir araya getirip bu aktiviteler arasında koordinasyonu sağlar. Bu çalışmada yazılım etmenlerinin kullanıldığı eğitimde kullanılan yazılım sistemleri ve etmenlerin bu sistemlere sağladıkları faydalar incelenmiştir. Etmenlerin sahip olduğu özerklik, çıkarsama yapabilme, hedefleri doğrultusunda planlar yapıp bunları uygulamaya geçirebilme, ortamı dinleyen ve algılayan yapısıyla gerektiğinde planlarında değişiklik yapabilme gibi akıllı olarak nitelendirilebilecek özellikleri, etmenlerin kullanılma nedenlerinin başında gelmektedir. Bu çalışma ile etmenlerin temel özellikleri ile diğer yöntemlerden üstünlükleri göz önüne alınarak etmenlerin sistemler üzerindeki başarımları değerlendirilmiştir.

İncelenen uygulamalarda öğrenci odaklı, öğrencilerin öğrenme stilleri ve bireysel özelliklerine uygun sistemler geliştirildiği görülmüştür. Değişen öğrenci seviyelerine göre kendini düzenleyebilen yapılara sahip olduğundan zeki etmen mimarisi sayesinde öğretim her öğrencinin seviyesine ve ihtiyaçlarına göre materyallerle desteklenmektedir. Bu yöntemin öğrencileri üzerinde başarı düzeyini yükselttiği gözlemlenmiştir. Ayrıca havacılık alanında kullanımı ile hem eğitim maliyetlerinin düşmesi, hem can güvenliği, hem performans çıktısı, hem de ortamı algılayan etmenler sayesinde öğrenciye özgü eğitim modeli sağlanmaktadır.

Dağıtık yapay zekâ alanındaki ilerlemelere paralel olarak bulunduğu durumla iletişim halindeki zeki yazılım etmenlerinin, gelecekte geliştirilecek eğitim yazılımlarında çoklu ve işbirlikçi yapıda kullanılması öğrenciler üzerinde oldukça hız ve başarım kazandıracaktır. Ülkemizde de bu tarz çalışmaların yapıldığı bilinmekte ve bu çalışmaların birçok alanda yer bulacağı düşünülmektedir (Moore, 2013; Ergün, 2013; Özbek, 2007; Pena, 2002).

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Evaluation Of Delivery Of Maritime Education And Traning In English In Turkey

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Abstract
English language is the common language in the shipping industry. A common language in the international maritime world is now even more essential, since most ships are today manned by multinational officers and ratings. This fact motivates and necessitates the learning of the English language by those who would wish to pursue a career path of becoming a seafaring officer. Maritime regulations issued by either international maritime organizations or national legislative institutes clearly define the requirement for certain level of English language skills for seafarers. Because of the growing dominance of English and its universal power, English has also been widely accepted as Lingua Franca for maritime business.

Despite the fact that English language is widely accepted as Lingua Franca in maritime environment including education institutes, some of the prominent Turkish professors advocate the need of Turkish language in education.

Currently, the general English knowledge level of the Turkish cadets is not fully sufficient to follow intensive Maritime Education and Training (MET) programmes. This fact is apparent from the many difficulties presently encountered by lecturers teaching the students vocational units in English. To enhance the English language skills of the cadets, some MET institutes have already started to deliver regular preparatory English class programmes.

In this study, delivery of MET programmes in English is discussed including a survey conducted for the Turkish cadets about the importance of English. The results are evaluated and some proposals are introduced for future studies.

Key Words: Maritime English, Maritime Education and Training (MET), STWC, SMCP, Lingua Franca.

Introduction

As the world becomes more and more globalized in almost all areas including business, most global organisations and multi-cultural companies around the world have already come to recognise the importance of one commonly shared language as a practical tool for internal and external communication. To fulfil this requirement, English which is currently the most widespread language in the world, has been adopted as the primary mode of communication as a result of a number of historical developments over recent centuries.

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Communication among parties in the operation chain was not usually a problem. However, over the past 30 years or so, 86% of the world's merchant ships have become multilingual and multi-ethnic in crew composition. As a result the English language has become the most common language in the merchant marine profession. A common language in the world of shipping is now even more essential, since most ships are today manned by international crews - officers and ratings. This fact motivates and necessitates the learning of the English language by those who would wish to pursue a career path of becoming a ships' officer.

Relevant investigations have revealed that more than three in ten accidents occurring at sea or in ports can be attributed to communication deficiencies, primarily to an insufficient command among seafarers or other maritime personnel of what is called Maritime English (Trenkner et al, 2013).

Research Method

The aim of this study is to discuss and evaluate the delivery of MET programmes in English in Turkey. The results are evaluated and some proposals are introduced for future studies.

The research has been conducted in four stages. At the beginning of the study, maritime mandatory regulations for English language which are issued by international and national legislative institutes are introduced. In the second stage, some aspects of maritime education and training in English are investigated. In the following stage, the results of a survey conducted for the Turkish cadets on the importance of English in maritime sector are evaluated to realize problem areas. In the final section of the study, the overall results and recommendations are introduced. The results of this study may also be used for future studies related to the maritime English and MET.

English As Lingue Franca In Maritime Affairs

The English language is now a common language in all type international interactions. The growing dominance of English and its universal power has been demonstrated in a variety of specific academic, social and commercial communications throughout the world. A study made by Choi (2014) showed that 'among international periodical publications around the mid-1990s, more than 75% and 90% respectively of social and natural science articles were presented in English'. The prevalence of English in business is even more remarkable:

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85% of international organisations grant English an official status, and Asia and the Pacific regions conduct approximately 90% of their proceedings solely in English (McKay, 2002).

In surveys, 91% of employees in multinational companies stated that a good command of English is highly important to their work performance, and 89% suggested that better career development opportunities will be given if employees are able to communicate in English at a satisfactory level (Desai, 2009). Some experts (Crystal, 2003; Graddol, 2006; Powell, 2010) accepts that English is positioned as the most common and widely shared language for international communication, and that it is not likely to be replaced in the near future.

For these reasons, English as a Lingua Franca has been widely accepted as a practical communicative tool in world for communication between speakers 'who share neither a common native tongue nor a common (national) culture, and for whom English is the chosen foreign language of communication' (Firth, 1996). When narrowing its focus down specifically to maritime activities in a lingua franca setting, the term 'Maritime English as a Lingua Franca' (MELF)" can also be used as a similar application. No matter which is used, these kinds of terms can be seen as representing a functional language system intended to facilitate effective communication between non-native speakers in multi-cultural settings of maritime environment.

MELF includes all levels of maritime interactions, which typically take place between non-native speakers, and focuses on how they successfully communicate for the achievement of communicative goals based on mutual intelligibility in a multicultural setting, regardless whether or not it conforms to English native speaker norms', which has been the major concern and regarded as a standard in past language education (Choi, 2014).

MELF has three major distinctive language systems between interlocutors characteristics – neutrality, practicability, and cultural-diversity – compared to the others.

- First, it is 'a neutral and shared communication code'. Considering that English is used between non-native speakers, it can serve as a 'neutral' instrument to all the interactants. Also, considering that it is used as a common communicative tool in global business communication, it can be seen as a 'shared' language system between interlocutors,

- Second, MELF has a highly practical nature which focuses on efficient, relevant and economic use of language by considering English as merely 'one tool in a business toolkit',

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- Finally, MELF has an inherent cultural diversity with no preference or bias towards one specific culture, since the communication usually takes place between non-native speakers who have a variety of cultural backgrounds.

International And National Regulations Related To Use Of English In Shipping

There are many international and national maritime regulations enacted by the regulatory bodies which dictate use of English language in maritime business in particular for seafarers. These will be introduced in two groups.

- International Maritime Organization (IMO) Regulations

Standards of Training, Certification and Watch Keeping (STCW) Convention

The STCW is the main convention which regulates international standards for training; certification and watch keeping standards for the seafarers. In Chapter-II, Section A-II of amended STWC Convention explains the mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnages or more. These mandatory requirements about English language are as follows;

Competence:

Use the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases (SMCP) and use English in written and oral form.

Knowledge, Understanding and Proficiency:

English language

Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships and coast stations and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases.

Methods for Demonstrating Competence:

Examination and assessment of evidence obtained from practical instruction.

Criteria for Evaluating Competence:

English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted.

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Communications are clear and understood.

By comparing the deleted and added part of seafarers' English competence, some other related terms of the amendments are as followed;

In addition to that section The table A-VI/1-4 which covers all seafarers, has been added the context of competence to 'contribute to effective communications on board ship' to take place of the context of competence to 'understand various orders and make oneself clear', indicating that seafarers should not only be able to communicate during work but also cooperate in daily life on board ship. The specific standards of competency require seafarers have the ability to 'understand the principles of effective communication between individuals and teams within the ship', 'establish and maintain effective communications' and 'have basic team working principles and practice, including conflict resolution'.

The 2010 Manila amendment has been added the ability of 'state possible errors in ECDIS (Electronic Charts Display Information System) by words and explain why ECDIS is not the only navigation facility' to the aim of the ECDIS training; As well in the section A-VI/1 requirements have been added that duty schedules should be made in standard format and working language on board should be English. In section A-VIII/2 the seafarers' competence to communicate efficiently in engine room, operate the ship's communication system expertly, communicate with each other without any obstacles and transfer accurate information about running state of equipment's in the engine room, has been highlighted.

Based upon the alterative parts of the amendments, the new competence standard not only emphasizes the English communicative ability and practical abilities of seafarers in their working situations to a higher degree, but also highlights their abilities of effective communication, especially commanding open communication between SMCP and ECDIS/VTS (Vessel Traffic Service). In the meantime, in consideration of many seafarers from different nationalities working in the same ship, the point that seafarers should have the abilities of using their working language on board (English) in management, leadership, coordination and decision making, and the abilities of information exchange and sharing, is proposed in the amendments for the first time.

Standard Marine Communication Phrases (SMCP)

Discussions regarding the problems of language difficulties arising on board ship at sea, crewed by multi-national seafarers started as early as the 1970s. By 1973, IMO had been

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agreed that a common language should be used for navigational purposes and that language should be English. This led to the development of the Standard Marine Navigational Vocabulary (SMNV), which was adopted in 1977 and amended in 1985.

After many years of sustained research, the Standard Marine Communication Phrases (SMCP) came into being in 1997 when the MSC (Maritime Safety Committee) adopted the draft. With the advent of the International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW), the usage of the SMCP became mandatory for officers and ratings on board ships.

SMCP was developed to create a common language in English for all seafarers. The objective of which is to reduce and, if possible, eliminate oral communication failures stemming from poor command of the Maritime English language. Knowledge, understanding and the competence to use the SMCP are required for officers in charge of a navigational watch on vessels of 500 gross tonnages or more. Use of these English communication phrases should be made as often as possible in preference to other wording of similar meaning and they should be part of instruction in maritime education and training.

In this way they are intended to become an acceptable safety language, using the English language, for the verbal interchange of information between individuals of all maritime nations on the many and varied occasions when precise meanings and translations are in doubt, increasingly evident under modern conditions at sea.

SMCP are built on basic knowledge of the English language, and they have been drafted in a simplified version of maritime English intentionally reducing grammatical, lexical and idiomatic varieties to a tolerable minimum and standardized structures for the sake of the function of the SMCP, i.e. diminishing misunderstanding in safety related verbal communications.

- National Regulations for Maritime English

The signatory adopted IMO STCW rules in their national legislation and also accepted English language as a basis for maritime education and training. For example, Regulations for Seafarers which is issued by Republic of Turkey Ministry of Transport, Maritime Affairs and Communication on 31 July 2002, clearly states that the requirements in this regulation are based on the requirements of STWC under the heading “Basis” as follows;

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"Basis:

Article 3- These regulations are based on the requirements of "the 1978 International Convention on Standards of Training, Certification and Watch Keeping for Seafarers" (STCW-1978) as amended in 1995 (STCW-95), to which the Government of Turkish Republic has become a party by Act 3539-20/4/1989".

In this context, the article 54 of the Ministerial Regulation for Seafarers Education and Examination also explains the basic rules of English Education and Examination. On this subject, there are several regulations such as Regulation on Radio Operators Qualifications and Examination dated 04 June 2004.

Maritime Education And Training In English

It is certainly evident that English is positioned as the most common and widely shared language for international communication, and that it is not likely to be replaced in the near future. The emphasis of Maritime English teaching should be placed on language practical competence. Owing to its characteristics of the highly concerning with foreign affairs, navigation profession could be an international activity which makes seafarers pass in and out of other countries' territorial waters, inland rivers, harbour districts frequently, and communicate with VTS and port state inspectors, all of which require seafarers to acquire effective English communication competence. To improve English, sailing and intercultural communication competence of seafarers, the theory of the English language and navigation professional knowledge should be combined.

The STCW convention is a regulatory and mandatory international document, which has to be observed by each country's marine administration, and on the other hand because it describes the required Maritime English (ME) linguistic competence for seafarers, the ME teachers have to consider when designing the teaching materials.

In the new circumstance of the development of modern maritime technology, the Manila amendments to the STCW convention emphasize the importance of effective communication between seafarers especially the English using at ship-shore and on ship. Therefore, maritime English education should aim at adapting the variation trend of competence standard according to the current difficulties in English in working environment of seafarers and the practical requirement of them.

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Because of the STCW requirements regarding the seafarers' English language competence, the Maritime English materials should be designed to meet these requirements. This implies the tailoring of the language instruction to meet the learners' needs and expectations in specific contexts. In order to define the learners' needs, a needs analysis should be carried out. The Needs Analysis charts are used to determine together the situations/contexts where Maritime English will be needed and the skills involved, e.g. speaking and listening for on board and VHF communications, reading for maritime publications, instructions or maintenance manuals, writing for drawing up reports or completing the log book.

As the English language has become "lingua franca" of Maritime field, knowledge of this language is indispensable part of any seafarer's education. Nevertheless, vast majority of accidents at sea happen due to human factor and language barrier. The reason for this lies in the fact that seafarers are taught Maritime English without sufficient General English knowledge what impedes their perception and results in lack of language competency (Pritchard et al, 2013b).

Therefore, General English should be taught to seafarers at first stage before they receive certain knowledge of the field necessary for mastering of Maritime English. Since Maritime English contains a lot of specific information which will be perceived better if trainee already has some background knowledge of corresponding technical field.

Cadets should have more motivation and must be interested in gaining good basis of General English for consequent studies of maritime language. The better the basis of General English cadets have, the better the students will be able to study any English for special purposes including Maritime English. In this context, to enhance the General English language skills of the cadets, some MET institutes have already started to deliver regular preparatory English class programmes.

- The Profile of a Maritime English Instructor

There is a constant need to consider the professional profile of a qualified the Maritime English instructor in order both to satisfy the demands of the current legislation and the requirements of the maritime industry. The linguistic knowledge and competence in Maritime English made on the Maritime English instructor/teacher basically depend on the following:

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Knowledge and competence in the English language as lay down by the IMO STCW Convention and other IMO conventions or documents (ISM Code, PSC, ISPS, SOLAS, etc.)

Levels of knowledge and competence required for instructor in the post-secondary and tertiary education (maritime academies, colleges, universities) for each country and those requirements set out by such international associations as IMLA, IMEC, IAMU, ICS, etc.

Requirements of national legislative bodies,

Requirements of the employer (MET institutions, ship-owners, crewing agencies, in-house requirements by employers, especially on Maritime English for occupational purposes),

Evaluating and applying the results of constant research into Maritime English and its linguistic features and the methodology of teaching Maritime English, English for Specific Purposes, and English for General Purposes, particularly those related to teaching of English as a foreign language. These requirements should also be adjusted to the particular language learning level (elementary/ beginner/ post beginner, intermediate, advanced).

The ideal ME teacher should hold an academic degree (BSc/BA) in English language and teaching. Thus, upon completion of these studies s/he should undergo a process of maritime familiarization study as explained below;

Acquiring knowledge of and competence in the specific linguistic features of Maritime English as well as the specifics of the methodology of teaching Maritime English, and

Knowledge of the subject matter (maritime studies) acquired through cooperation with the technical subject teachers and during occasional on-board training.

A good teacher will also combine General English and Maritime English courses in the most effective way to ensure integration of maritime lexics and terminology so that students do not find it difficult to acquire offered knowledge on the proper level. But the point is that a problem of maritime field is lack of proper specialists of Maritime English who will be able to teach the course properly and get maximum results from the students.

- Cultural Awareness Education

Any language is a part of national culture. Successful language learners usually get close to the language they study and to the culture this language belongs to. Mastering of general English is a good way to break cultural barriers. They will understand each other better not only on linguistic but also on the cultural level. When learners of English get closer to the language not only from linguistic point of view but also from cultural point of view, different

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ways of human communication, including body language and means of non-verbal communication become more familiar to them. It facilitates communication of seafarers from different countries with each other thus ensuring safety and decreasing risk factors.

Nowadays, due to the ever growing mixed-nationality crews employed on board ships (for commercial reasons), another problem has arisen besides poor Maritime English knowledge, namely, the cultural awareness and the lack of training in this respect, which may lead to further threats to the safety of the ship and crew. Jan Horck (2010) advocates the need for cultural awareness education to bridge diversity gaps for the benefit of the shipping industry. He states that 'People working in shipping industry cannot afford to make mistakes and take wrong decisions because of miss-communication. If the crew cannot communicate, it might be fatal. Miscommunication is costly and it can destroy ones reputation as a quality operator. If people do not understand the meaning of what is said due to weak English and cultural differences prejudice, power distance and stereotyping, the entire industry will continue to have a bad reputation'. Therefore, proper courses on communication and cultural awareness should be included in MET institutions curricula to minimise and ultimately to avoid such risk factors as alienation, loneliness, anxiety and to promote, at the same time, cultural sensitivity and ethnic tolerance.

- Opposite Views of the Turkish Professors for English Education

Despite the fact that English language is widely accepted as Lingua Franca in maritime environment including education institutes, some of the prominent Turkish professors advocate the need of Turkish language in education. As an example of this approach, Prof. Sinanoglu said that "to give up the illusion of education in a foreign language, mother tongue as the language of instruction when we adopted our education, there is no reason today to be one of the world's widespread and effective language". In a similar way, Prof. Gokcora is also stated that 'How science is used as the Turkish language, culture, music, literature, oral and written, regardless of the language as a powerful and unique video broadcasting; The language is Turkish, cultural assets are protected and live that long. To prevent the disappearance and extinction processes of Turkish language, Turkish arms' dictionary presence should be expanded".

Gizir (2005) has stated his view on the English language level of the students in the Middle East Technical University which the courses are delivered in English. 'When the problems

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associated with being English the language of instruction is examined, 15% of students stated that encounter any problem in this regard, % 80.7 respectively 'lack of teaching English in the Preparatory School, 'not sufficiently understood the subject matter', 'Insufficient English language level of the faculty members'. The students also stated that they have experienced problems with 'the alienation of Turkish terminology and inability to express them adequately'. Also Simsek and Aytemiz (1996) states that 'because of studying in a foreign language graduates of METU Turkish terminology and alienated their students after graduation, but noted problems in adaptation to the society they live in. The METU, the traditional strengths stressed that one of the effects of training in English gradually loses its old strength. These findings are consistent with the findings of this study.

Taking into account these views which emphasise the importance of Turkish language in education and general acceptance of English as a Lingua Franca in maritime activities, it would be a compromise solution to use Turkish language for some basic science classes such as mathematics, physics and English language for maritime branches such as navigation, marine communication.

- English Related Problems in Turkish Maritime Education and Training Institutes

In this maritime world, "effective communicative competence" is an increasingly paramount factor for carrying out safe and successful operation. However, several researchers argued that the lack of communication skills among non-native English speaker seafarers is still a crucial problem. Despite the efforts and time students spent in their pursuit of English proficiency, they often fail to see pleasing results from their study of English. Therefore, it is crucial to place more emphasis on improving students' communicative skills in English. In this context, some of the problems encountered in Turkish maritime education and training institutes are as follows (Demirel, 2013);

- The roots and grammar of the Turkish language is totally different from other Latin origin languages.
- Content of the English language teaching materials is inadequate in teaching the Turkish seafaring officers.
- Excessive criticism made by English instructors dissuades the students from speaking.
- The native English instructors in Turkey have limited training and language skills of maritime English.

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- Attitude of other Turkish instructors teaching English (easy way to use Turkish when the students cannot follow the lecturer).
- Visual teaching-aid material is insufficient.
- Requirement of new methods for measurement of English level for cadets.

As a partial solution to these problems, the instructors must develop special lesson plans and use innovative delivery techniques, which may include: revision of the existing syllabi and, teaching materials - books related to the profession, test exercises, video and audio tapes/CDs, audio-visual equipment, etc. All this requires good planning for their introduction into the class-room. In addition to these efforts, a multitude of experts on both navigational majors and linguistics have to gather in a team for the compilation of maritime textbooks which should be specially designed for Turkish cadets.

A Survey On The Importance Of English In Maritime Sector

A research was conducted to analyse the effectiveness of Maritime Test of English Language-MarTEL Phase II to assess Maritime English skills of an officer of the watch. For the research, a survey was applied to 55 senior cadets who have a sea experience of 5 to 12 months. Education, sex (only 3 of them female), nationality and age questions are asked for further researches but not evaluated at this stage because all participants represent a homogenous group. The results of the survey have been introduced in the IMEC 22 proceedings (Ziarati et al 2010). The final part of the survey questions were about the importance of English language in maritime business. In this context, total of 11 semantic questions are asked. These questions are displayed in Table 1.

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	STATEMENT	YES	NO
1	In my experience, ability in the English Language is important for a career in the marine industry		
2	Maritime English is more important in the marine professions than literary English (the English of books and newspapers)		
3	Professional development is not possible in the marine professions without improving Maritime English Language skills at the same time		
4	Good Maritime English is a transferable skill that can help my employment in a global industry		
5	Good Maritime English will help me achieve better salary and conditions of service		
6	It is not possible to operate in a global maritime industry at officer levels without good Maritime English		
7	SMCP is a useful international Maritime English tool but it has many limitations in practice		
8	Maritime English should be taught at college.		
9	I understand that at a later time I might move away from the sea. Good Maritime English will be a useful skill in other industries		
10	It is necessary to plan my learning throughout my career both in professional advancement (STCW) and in Maritime English		
11	Maritime English should include social English and elements of formal English for written communications		

Table 1: Semantic test questions: (YES is 5 points and NO is 1 point).

In this research quantitative research method is used. The evaluation of survey results carried out with statistical procedures using SPSS 16.0 (Statistical Package for the Social Sciences) programmes is listed below in Table 2 and Figure 1.

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Questions	N	Minimum	Maximum	Mean	Std. Deviation
Importance	55	2	5	4,82	0,945
Literature	55	1	5	4,55	1,451
Professional	55	2	5	4,82	0,945
Employment	55	1	5	4,27	1,779
Income/Career	55	1	5	4,73	1,146
Operational	55	1	5	4,45	1,573
SMCP	55	1	5	3,64	2,247
Taught at college	55	2	5	4,73	1,146
Useful	55	1	5	2,91	2,489
STCW	55	2	5	4,73	1,146
Social/Formal	55	2	5	4,27	1,779
Valid N (list wise)	55				

Table 2: Semantic test results.

Except the response to question 9 (I understand that at a later time I might move away from the sea. Good Maritime English will be a useful skill in other industries), almost all participants who are senior cadets prepared to go sea duties, have agreed the importance of English language in maritime business.

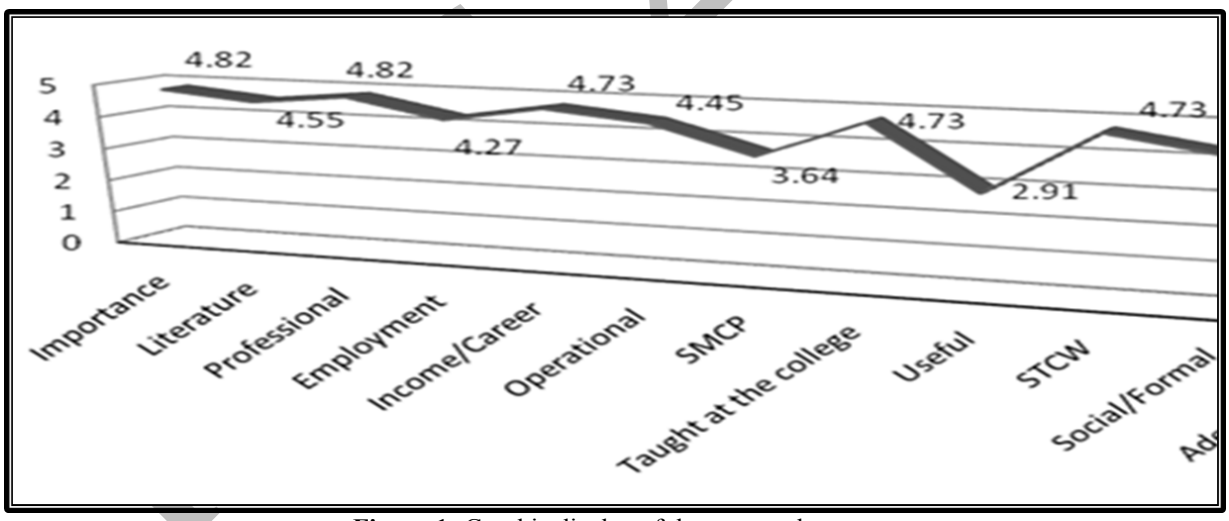


Figure 1: Graphic display of the test results.

CONCULUSIONS AND RECOMMANDATIONS

- Conclusions

- All maritime activities which are mostly international in nature require seafarers to acquire effective English communication competence.

- A common language in the world of international shipping is now even more essential, since most ships are today manned by international crews. This fact motivates and necessitates the learning of the English language by those who would wish to pursue a career path of becoming a ships' officer.

- Mastering of general English is a good way to break cultural barriers. They will understand each other better not only on linguistic but also on the cultural level. It facilitates communication of seafarers from different countries with each other thus ensuring safety and decreasing risk factors.

- The Convention on Standards of Training, Certification and Watch Keeping for Seafarers (STCW) explains the mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnages or more. These mandatory requirements dictate the use of English language by all unlimited seafaring officers.

- Since many seafarers from different countries working in the same ship, seafarers should have the abilities of using their working language on board (English) in management, leadership, coordination and decision making, and the abilities of information exchange and sharing.

- As a result of STWC requirements, Standard Marine Communication Phrases (SMCP) was developed to create a common language in English for all seafarers. The objective of which is to reduce and, if possible, eliminate oral communication failures stemming from poor command of the Maritime English language.

- Similar to International Maritime Organization, national legislation also accepts English language as a basis for maritime education and training.

- English as a Lingua Franca has been widely accepted as a practical communicative tool in world for communication between speakers 'who share neither a common native tongue nor a common (national) culture.

- There is a constant need to consider the professional profile of a qualified the Maritime English instructor in order both to satisfy the demands of the current legislation and the requirements of the maritime industry.

- Despite the efforts and time students spent in their pursuit of English proficiency, Turkish cadets often fail to see pleasing results from their study of English.

- Despite the fact that English language is widely accepted as Lingua Franca in maritime environment including education institutes, some of the prominent Turkish professors advocate the need of Turkish language in education.

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- A survey was conducted to analyse the importance of English language in maritime business. Almost all participants have agreed the importance of English language in maritime business.

- As a final conclusion, it can be said that competence of English language is a prerequisite of conducting all aspects of maritime activities successfully and safely.

- Recommendations

- To improve English, sailing and intercultural communication competence of seafarers, the theory of the English language and navigation professional knowledge should be combined.

- General English should be taught to seafarers at first stage before they receive certain knowledge of the field necessary for mastering of Maritime English.

- To enhance the English language skills of the cadets, all MET institutes have to deliver regular preparatory English class programmes.

- The ideal ME teacher should hold have advance English language and teaching skill as well as maritime background. The regular English language lecturers should undergo a process of maritime familiarization study (marinization) to deliver Maritime English.

- Proper courses on communication and cultural awareness should be included in MET institutions curricula to minimise and ultimately to avoid such risk factors as alienation, loneliness, anxiety and to promote, at the same time, cultural sensitivity and ethnic tolerance.

- As a solution to English learning problems faced by Turkish cadets, the instructors must develop special course programmes and use innovative delivery techniques, which may include: revision of the existing syllabi and, teaching materials - books related to the profession, test exercises, video and audio tapes/CDs, audio-visual equipment, etc. In addition to these efforts, a multitude of experts on both navigational majors and linguistics have to gather in a team for the compilation of maritime textbooks which should be specially designed for Turkish cadets.

-Taking into account the importance of Turkish language in education, it would be a compromise solution in MET institutions to use Turkish language for formative science classes such as mathematics, physics and English language for delivery of maritime subjects such as navigation, marine communication, cargo operation, and maritime management.

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Examination Of Level Of Teacher Candidates' Using Smart Phone Technology And Benefiting From The Opportunities It Presents In The Context Of Digital Divide

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Abstract
The aim of this research which has been realized by the teacher candidates being educated at Sakarya University, Faculty of Education, Faculty of Theology and Physical Education Sports Department to make evaluations in the frame of digital divide by examining the prospective teachers' usage of smart phones from digital technologies and level of benefiting from the opportunities it presents. The sample of the research has been determined according to aimed sampling method and teacher candidates from Physical Education Sports Department, Religious Culture and Moral Knowledge Teaching, Psychological Consultancy and Guidance Departments have been included in the research. "Using Smartphone and Level of Benefiting from its Opportunities Level Scale" which has been developed by the researchers has been used in the collection of the data. The data has been transferred to SPSS program; firstly descriptive statistical procedures have been realized. T-test to compare the average of two groups, one-way variance analysis statistical procedures to compare more than two groups has been realized. At the result of the findings, it has been determined that the teacher candidates largely have smart phone technologies; they used these technologies too much and benefited from these technologies on every subject. As a result it has been reached that this top level benefiting created a gap opposite to the teacher candidates who do not have smart phones.

Key words: Smartphone, Digital technology, Digital divide, Technology usage, Mobile phone

INTRODUCTION

Changes in information and communication technology (ICT) (Kotkin, 2000) brings necessity of individuals who use technology effectively and know the way of reaching information rapidly (Seferoglu and Akbiyik, 2007) and societies with these individuals are named as developed countries which has strong economies. Contribution of ICT on economy in these countries is in direct proportion with the common usage nationally (Ozturk, 2005). However, the difference between the countries which developed mostly and have been developing on ICT increases (Ege, 2008) and because of this reason many countries give importance on the usage of ICT to adapt themselves economically (Livingtone and Helsper, 2007).

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Inequalities which have been met in access and usage of ICT are stated as "Digital Divide". (Atkinson, Black and Curtis, 2008; Underwood, 2007; Saleh 2009; Seferoglu, Avci and Kalayci, 2008, Aytun 2005; Geray, 2003). In other words, digital divide is the differences in the context of access to ICT and internet usage opportunities between individuals, household, enterprises and geographical regions at different socio-economic levels. (OECD, 2001). Campaine (2001) defines digital divide as the difference between the ones who have the newest information technologies access and the ones who do not have, Hargittai (2003) defines it the difference between the ones who can reach digital technologies and the ones who cannot reach or the ones who use digital technologies or not.

DiMaggio, Hargittai, Neuman and Robinson (2001) state that it is required to be concerned not only with inequalities at access to internet but also software, equipment, content of the connection and skills of using technology also with inequalities between the people who access internet. Onur (2007) asserts that technology/computer literacy has an important place in the inequalities in distribution of the technologies in the countries and it does not seem possible that in case of not solving this problem digital divide cannot be decreased. In general, three indicators as (1) access, (2) usage and (3) ICT literacy are claimed about digital divide (Yıldız and Seferoglu, 2013; Hohlfed, Ritzhaupt, Baron, Kemker, 2008; Tein and Fu, 2008; Geray, 2003; OECD, 2001). (1) *Access* provides the individuals reach software, equipment, internet and technology support ((Hohlfed, Ritzhaupt, Baron, Kemker, 2008); (2) *Usage* provides the individuals have ICT knowledge and skills (Solomon, Allen and Resta, 2003); (3), *ICT literacy* provides individuals which resources they can apply while looking for, selecting , processing and reaching information (Van Dijk and Hacker, 2003).

The information and communication technology (ICT) has created new tools, such as personal computers and the internet (Chakraborty and Bosman, 2005). However, it is not true to limit ICT with these two concepts. Because, ICT has a large field from TV to tablet computers. Especially starting from 1990's mobile phones entered human beings' lives as a new instrument on ICT. Mobile phones developed continuously since it has entered the human beings' lives, they produced more developed models then the previous year in the context of their features every year. As a result, personal computers became portable in the pockets or handbags of the individuals as smart phones.

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Providing smart phones' access to internet made internet more important for accessing internet in a rapid way. Because, people need information access not only in a city centre but also in the middle of a piece of land. In this context, smart phones as ICT which people continuously carry with them ease access to internet which is seen as a miracle communication device providing to eliminate the inequalities for reaching knowledge in the world (Cheviron, 2006, 116-117).

Prevention of digital divide is possible by eliminating the inequalities in ICT usage and access to ICT. While internet has an important place especially in educational area, the effects which digital divide will create are questioned (Iske, Klein and Kutscher, 2005). Underwood (2007) explains digital divide as digital gap between teachers and students by taking it in the frame of education. In this research, a mission related to preventing the increase of gap between students and teachers has been adopted and teachers' usage level of smart phones taking place in ICT during their education periods and their levels of benefiting from the opportunities which smart phones present digital has been tried to be determined.

The Aim Of The Research

The aim of this research is to make an evaluation on teacher candidates in the frame of using smart phone taking place in digital technologies and benefiting level from the opportunities which these phones provided for the individuals. The questions below have been tried to be answered to reach this aim:

1. What is smart phone usage level of teacher candidates?
2. What is benefiting level of teacher candidates from the opportunities which these phones provided for the individuals?
3. Smart phone usage level of teacher candidates and benefiting level from the opportunities which these phones provided:

a. Does it show any difference according to internet access situation in their houses (pension, dormitory,etc)

b. According to internet access quote in their houses (pension, dormitory,etc)

c. According to internet access situation by the way of 3G in their mobile phones,

d. According to internet access situation at their schools,

e. Their departments where they take education?

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Limitations

This research is limited with the teacher candidates having education at Sakarya University, Faculty of Education, Faculty of Theology and Physical Education Sports Department in 2013-2014 semester. Also this research is limited with smart phone usage from ICTs and the opportunities the smart phones provided.

METHOD

Model Of The Research, Population And Sample

The research is quantitative research which has been realized in the survey model taking place in survey models. The population of the research is formed of teacher candidates having education at Sakarya University, Faculty of Education, Faculty of Theology and Physical Education Sports Department in 2013-2014 semester. The sample of the research has been determined according to aimed sampling method from unlikely sampling methods. Totally 302 students from third grades of Physical Education Sports Department, second grades from Faculty of Theology, third grades from Elementary School Mathematics Teaching Department, second grades from Elementary School Teaching Department, first grades from Psychological Consultancy and Guidance Departments have been included in the sample.

Data Collection Instruments

"Level of smart phone usage and benefiting from the opportunities the smart phones provided Scale" which has been developed by the researchers as a data collection instrument has been used. 17 questions take place which have been prepared according to five point Likert scale relevant to the level of smart phone usage and benefiting from the opportunities the smart phones provided in the scale. The scoring of the questions taking place in the scale is "never=1" point, "Rarely=2" points, "partially=3" points, "Largely=4" points, "Completely=5" points. "1,00-1,79" for "never", "1,80-2,59" for "rarely", "2,60-3,39" for "partially", "3,40-4,19" for "largely" and "4,20-5,00" for "completely" score points have been taken into account in determining the arithmetical averages of these points. "0,953" has been determined as "Cronbach's Alpha" value as a result of reliability study realized for 17 questions.

Table 1. Kaiser-Mayer Olkin (KMO) Sample Measurement and Barlett's Test results of the scale

KMO Sample Measurement Competence Value	0,939

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Barlett Test Approximate Ki-Square Value	3874,751 sd=136, p=0,000

As seen in table 1, sample measurement competence value (KMO) has been determined as "0,939" at the result of validity study. As this value has been over "0,70", it is accepted that sample number has been sufficient. Barlett's Test value showing there is a meaningful difference between sample number and item number in the scale has been found as "p=0.00<0,05". Also, the scale can measure "%67,505 of the requested measuring feature. Load values of every item in the scale are in "0,471-0,822" gap. The scale is formed of two factors. The first factor is named as "level of smart phone usage**"**, second factor is named as "Benefiting from the opportunities the smart phones provides".

Collection and Analysis Of The Data

After the data has been collected in spring period of 2013-2014 semester by the researchers, they have been transferred to SPSS 17.00 computer program. Firstly, descriptive statistical procedures have been realized at every dimension and item base. t-test to compare the averages of two groups, "One-way ANOVA" statistical procedure to compare more than two groups have been realized. If there is a meaningful difference at the result of One-way ANOVA" statistical procedure, multiple comparison "TUKEY" statistical procedure has been realized. "p<0,05" meaningful level has been looked for in two of the statistical procedures.

FINDINGS

1. Findings related to level of smart phone usage of teacher candidates

Descriptive statistics related to level of smart phone usage and benefiting from the opportunities the smart phones provides for teacher candidates have been given in Table 2.

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Table 2: Descriptive Statistics

	Variables	N	$\overline{X}$	sd	V%
1	I know keeping information in smart phone.	283	3,912	1,103	28,195
2	I know how to transfer the information in the smart phone.	283	3,936	1,128	28,658
3	I know loading any program in my smart phone.	281	3,957	1,227	31,008
4	I know removing any program from my smart phone.	277	4,004	1,226	30,619
5	I can use my smart phone with all its features.	276	3,678	1,099	29,880
6	I can connect to internet whenever I need from my smart phone.	281	3,915	1,192	30,446
7	I know loading and protecting the information from internet in my smart phone.	281	3,979	1,134	28,499
8	I can get information from internet with my smart phone.	278	3,993	1,111	27,823
9	I can use my smart phone whenever I need comfortably.	282	4,010	1,152	28,728
	Level of usage	188	3,751	1,002	26,712
10	I use my smart phone with the aim of studying.(educational programs,etc)	279	2,996	1,165	38,85
11	I use my smart phone with the aim of keeping information.	281	3,384	1,172	34,663
12	I use my smart phone in more than one course.	280	3,082	1,266	41,077
13	I use my smart phone with the aim of entertainment. (playing games, listening to music, etc) ,	283	3,721	1,067	28,675
14	I use my smart phone to follow the news from internet.(newspaper, magazine)	282	3,429	1,149	33,508
15	I use my smart phone with thpe aim of communication(e-mail,chat,etc)	283	3,781	1,112	29,410
16	I use my smart phone to follow social media. (twitter, facebook)	281	3,772	1,212	32,131
17	I use my smart phone with the aim of making research (doing homework,etc)	283	3,085	1,200	38,897
Level of benefiting from the opportunities it presents		274	3,422	,885	25,862
General		258	3,697	,877	23,721

When descriptive statistics are examined in Table 2, it is observed that teacher candidates are able to use their smart phones widely ($\overline{X}$ =3,751). When taken as item base, as averages related to every item have been in "3,678-4,010" gap, it has been reached the finding that they are able to use smart phone features related to every item to a large extent.

2. Findings on the level of benefiting of teacher candidates from the opportunities the smart phones provide

When findings on the level of benefiting from the opportunities which smart phones present are examined in Table 2, it is seen that the average is "3,422". This average takes place at the upper score gap that they benefit "partially", but at the bottom limit that they benefit largely. When findings on the level of benefiting from the opportunities which smart phones present are examined in items base, it has been determined that the teacher candidates use smart phones partially for studying their courses, keeping information, making research in

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more than one course or in internet. At other items base, score gaps show that they are used largely.

3. Findings on the level of using smart phones and benefiting of teacher candidates from the opportunities the smart phones provide.

Results related to t-test statistical procedures which have been realized with the collected data have been given in Table 3.

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Table 3. T-Test Results

Variables		N	$\overline{X}$	sd.	V%	t	p
Usable level	No access to internet at home	71	3,423	1,097	32,047	2,593	,010
	Access to internet at home	142	3,857	,949	24,604		
Level of benefiting from the opportunities it presents	No access to internet at home	76	3,303	,888	26,884	1,390	,166
	Access to internet at home	198	3,469	,882	25,425		
General	No access to internet at home	71	3,501	,914	26,106	2,224	,027
	Access to internet at home	187	3,771	,853	22,619		
Usable level	Limited access to internet at home	81	3,472	1,059	30,501	2,347	,020
	Unlimited access to internet	128	3,845	,959	24,941		
Level of benefiting from the opportunities it presents	Limited access to internet at home	87	3,331	,891	26,748	1,034	,302
	Unlimited access to internet	178	3,451	,890	25,789		
General	Limited access to internet at home	81	3,531	,903	25,573	1,893	,060
	Unlimited access to internet	170	3,755	,864	23,009		
Usable level	Unable to access to internet with 3G	13	2,419	1,350	55,808	5,380	,000
	Able to access to internet with 3G.	173	3,863	,897	23,220		
Level of benefiting from the opportunities it presents	Unable to access to internet with 3G	15	2,292	1,156	50,436	5,359	,000
	Able to access to internet with 3G	258	3,492	,823	23,568		
General	Unable to access to internet with 3G	13	2,276	1,188	52,196	6,487	,000
	Able to access to internet with 3G	244	3,777	,790	20,916		
Usable level	Unable to access to internet at school	68	3,247	1,109	34,154	4,317	,000
	Able to access to internet at school.	134	3,938	,908	23,057		
Level of benefiting from the opportunities it presents	Unable to access to internet at school	73	3,291	,964	29,292	1,497	,136
	Able to access to internet at school.	195	3,474	,860	24,755		
General	Unable to access to internet at school	68	3,466	1,017	29,342	2,549	,011
	Able to access to internet at school	184	3,783	,818	21,623		

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a. According to internet access at their homes (dormitory, pension, etc)

It has been determined that the teacher candidates' level of using smart phones (t=2,593 and p=0,01) and in general total of the scale (t=2,224 and p=0,27) shows a meaningful difference between the ones who have internet access at home (dormitory, pension, etc) and the ones who do not have, and level of benefiting from the opportunities it presents does not show a difference according to the free variable. When averages of level of using smart phones have been examined, it is seen that the average of teacher nominees who have internet

access have been “3,857”, whereas the average of the ones who do not have internet access have been “3,423”. At general scale, the average of teacher candidates who have internet access have been “3,772” whereas the average of the ones who do not have internet access have been “3,303”. According to these findings, it has been determined that both at the level of using smart phones and at general total, teacher candidates who have internet access at home (dormitory, pension, etc) have higher points.

b. According to internet access quote at their homes (dormitory, pension, etc)

When t test results which have been realized according to the limitations at internet access of teacher candidates at home(dormitory, pension, etc) have been examined in Table 3, there is a meaningful difference(t=2,347 and p=0,020), between levels of using smart phones of teacher candidates who have limited and unlimited internet access at home (dormitory, pension, etc), there is not a meaningful difference at the level of benefiting from the opportunities smart phones present (t=1,034 and p=0,302) and also in general (t=1,893 and p=0,60). When averages from the same table have been examined, it has been reached the finding that the teacher candidates with unlimited internet access have been higher from the teacher candidates with limited internet access at the level of using smart phones.

c. According to internet access from mobile phones with 3G

According to t-test results taking place in Table 3 and realized according to the access to internet with 3G from smart phones by teacher candidates, it has been determined that the averages taken on the level of using smart phones (t=5,380 and p=0,000),benefiting from the opportunities it presents (t=5,359 and p=0,000) and general total of the scale (t=6,487 and p=0,000) show meaningful difference. When averages from the same table have been examined, it is seen that at two dimensions and in general, the teacher candidates who have internet access from smart phones and do not have internet access have higher grades. In other words, it has been determined that level of using smart phones and benefiting from the opportunities smart phones present has been higher for the teacher candidates who can access internet with 3G than the ones who do not have access in addition to the scale.

d. According to internet access from their schools

According to t-test results taking place in Table 3 and realized according to the access to internet from schools of teachercandidates, it has been determined that there is a meaningful difference related to usage level of smart phones (t=4,317 and p=0,000) and general scale

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(t=2,549 and p=0,011). According to the level of benefiting from the opportunities smart phones present there is not a meaningful difference (t=1,497 and p=0,136). The teacher candidates who can access internet at their schools ($\overline{X}$=3,938) have higher level of using smart phones than the ones who cannot access to internet ($\overline{X}$=3,938). Also, related with the general scale, average of scores of teacher candidates who can access internet at their schools have been more than the ones who cannot.

e. According to the departments they took education

Table 4. One-Way Variance Analysis Results Of Teacher Candidates According To Their Departments

Dependent variables		Squares Total	Sd	Squares Mean	F	p
Level of using smart phones	Between the groups	5,509	4	1,377	1,384	,241
	In-groups	182,105	183	,995		
	Total	187,614	187			
Level of benefiting from the opportunities smart phones present	Between the groups	10,194	4	2,549	3,365	,010
	In-groups	203,720	269	,757		
	Total	213,914	273			
General	Between the groups	6,660	4	1,665	2,207	,069
	In-groups	190,876	253	,754		
	Total	197,536	257			

When One-way variance analysis results of teacher candidates according to their departments have been examined from Table 4, it has been determined that there is a meaningful difference between the levels of benefiting from the opportunities smart phones present (F=3,365 and p=0,10), there is not a meaningful difference in the frame of level of using smart phones (F=1,384 and p=0,241) and related to the general scale (F=2,207 and p=0,69). (TUKEY) multiple comparison test results have been given with the aim of determining that there is a difference between teacher candidates at different departments related to levels of benefiting from the opportunities smart phones present it Table 5.

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Table 5. (TUKEY) Multiple Comparison Test Results Between Teacher Candidates At Different Departments Related To Levels Of Benefiting From The Opportunities Smart Phones

	(I) Preference series	N	$\overline{X}$	ss	(J) Preference series	Average difference (I-J)	Standard error	p
Levels of benefiting from the opportunities smart phones present	Pys. Con. Guid. (PCG)	78	3,675	,813	MT	,350	,152	,145
					PE	,172	,158	,811
					RT	,361	,168	,203
					EST	,537*	,160	,008
	Maths Teac. (MT)	57	3,325	,864	PCG	-,350	,152	,145
					PE	-,178	,169	,829
					RT	,011	,178	1,000
					EST	,187	,171	,809
	Physical Educ.(PE)	50	3,503	,749	PCG	-,172	,158	,811
					MT	,178	,169	,829
					RT	,185	,183	,842
					EST	,365	,176	,235
	Religion teaching (RT)	41	3,314	,851	PCG	-,366	,168	,203
					MT	-,011	,178	1,000
					PE	-,189	,183	,842
					EST	,176	,185	,876
	Elem. Sch. Teaching (EST)	48	3,138	1,078	PCG	-,537*	,160	,008
					MT	-,187	,171	,809
					PE	-,365	,176	,235
					RT	-,176	,185	,876
	Total	274	3,422	,885				

*P<0,05

When (TUKEY) multiple comparison test results have been examined from Table 5, it has been determined that there is a meaningful difference at "0,05" level between teacher candidates being educated at PCG and teacher candidates at EST. When the averages of teacher departments in these two departments have been examined from the same table, teacher candidates being educated at PCG benefit more from the opportunities which smart phones present than the teacher candidates at EST.

RESULTS AND DISCUSSION

This research has been realized with the aim of making an evaluation in the context of digital divide by determining the level of using smart phone technology and benefiting from the opportunities it presents by the teacher candidates being educated at Physical Education Sports Department, Faculty of Theology and Educational Faculty , the data has been taken from 302 teacher candidates. The results below have been reached according to the findings:

The teacher candidates can largely use smart phones. Their level of benefiting from the opportunities it presents is just at the limit of score gap between "partially" and "largely". The

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result of teacher candidates' using smart phones largely with the aim of studying their courses, keeping information and making research in their course and internet at the level of benefiting from the opportunities it presents. If a generalization is required, it can be stated that teacher candidates are able to smart phones largely, they are able to benefit from its opportunities partially. Even a big problem has not been faced with especially at access dimension of digital divide which OECD (2001) defined as differences in the frame of ICT access and internet usage opportunities, it has been determined that the teacher candidates did not have performance at upper level at benefiting from the opportunities smart phones present in other words usage opportunities firstly internet.

The result of teacher candidates' being able to use smart phones and in general total of the scale there is a meaningful difference between the ones who have internet access and the ones who do not have at home (dormitory, pension, etc), the level of benefiting from the opportunities it presents does not show any difference according to same free variable has been reached. The teacher candidates who have internet access at home have higher scores both at level of using smart phones and at general total. In other words, it has been determined that teacher candidates' level of using smart phones who have internet access at home have been higher than the ones who do not have internet access at home.

It has been determined that there is a meaningful difference between the teacher candidates' level of using smart phones who have limited internet access at home than the ones who have unlimited internet access at home, at the level of benefiting from the opportunities it presents there is not a meaningful difference according to whether there is an internet access quote. Also, it has been determined that the level of using smart phones of the teacher candidates who have unlimited internet access have been higher than the teacher candidates who have limited internet access. Additionally, the teacher candidates who can access internet by the way of 3G have been higher in addition to general scale at the level of benefiting from the opportunities the smart phone presents and using smart phones.

The level of using smart phones is higher for the teacher candidates who can access internet than the teacher candidates who cannot access. There is not a difference according to accessing internet by teacher candidates between the levels of benefiting from the opportunities the smart phone presents Also, it has been determined that there is a meaningful difference between the teacher candidates according to the departments they have been

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educated at the levels of benefiting from the opportunities the smart phone presents, but there is not a meaningful difference related with the level of using smart phones and general of the scale. According to the result of multiple test result, there is a meaningful difference between the teacher candidates being educated at PCG and the teacher nominees being educated at EST related with the levels of benefiting from the opportunities the smart phone presents. (Atalay and Anagun, 2014).

As a result, the levels of benefiting from the opportunities the smart phone and the level of using smart phones which have been one of the ICTs between teacher candidates show differences in general and at variable base. When findings have been examined carefully, the teacher candidates, whose levels of benefiting from the opportunities the smart phone and the level of using smart phones are high, are the ones who can access internet comfortably at their homes or schools, have unlimited access and connect to internet with 3G. Because of this reason, as the schools are responsible from providing ICT usage and access to ICT for all students , the managers at these schools should create an environment in equal conditions for all students whatever the economic conditions of the students have been (Hawkins, 2002). In fact, in addition to sociologists as Di Maggio, Harittai, Neuman & Robinson (2001), university managers should also own the obligation of being interested with the inequalities between the ones accessing internet on time and the ones who cannot. Because, when managers focus on this subject, the individuals who completed their education at their universities should be able to use ICT equally and at the top level in solving the problems they met, organizing their knowledge, reaching knowledge, developing their skills and being informed from the developments. By this way, the distance between as Ogden (1996) stated "rich of knowledge" and "devoid of knowledge" will not be so far, contrarily en equality will exist.

Even if the teachers working on this field feel themselves adequate in ICT usage (Atalay and Anagun, 2014), it should not be forgotten that the differences determined at the end of the research between teacher candidates will also show themselves when they start teaching profession. In this situation "gap" concept in the definition of digital divide as stated by Underwood (2007) is digital gap between teachers and students, level of benefiting from the opportunities the smart phone and the level of using smart phones of teacher candidates starting from university years will be more or less in any way. As teachers have an important role in educating the individuals equipped with ICT skills (Atalay and Anagun, 2014) , the

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universities education these teachers should be questioned (Tein & Fu, 2008). Especially, education of the teachers playing an important role in training of new generations has been in question, this subject carries a great importance.

SUGGESTIONS

The suggestions below have been presented according to the research findings:

- Although the teacher candidates are able to use smart phones, they have to benefit from the opportunities they present.

- If increase in digital divide between teacher candidates is requested to be prevented, it is required to provide internet access in the environments where teacher candidates live in. Also, there should not be a limit in this access.

- The teacher candidates should be given opportunities for internet access from their smart phones by 3G. In this context, GSM operators can support our teachers who will educate the young generation who will be the guarantee of our future by organizing low cost and promoting campaigns for them.

- Establishment of substructures which will provide internet access from all schools for teacher candidates is required. All faculty and academies which aim at educating teachers who can use ICT in all conditions and reach information easily should be careful on this subject.

As a result, many researches present the requirement of educating teachers related with teacher competences on ICT usage (Ilgaz and Usluel, 2011). When it is talked about ICT usage, only individualistic computer and internet is recognized. However, new ICTs such as smart phones which existed as a result of developed technologies should be taken into account in addition to individualistic computer and internet. It can be told that by the way of smart phones taking place in ICTs, more information can be reached and internet access can be provided easily more than the computers. Because of this reason, teachers should be educated by arranging course programs again on this subject by taking the changing ICTSs in 21st century into account.

Suggestions to other researchers:

- This research which has been realized on teacher candidates can also be realized with other students at high school or university levels and teachers actively working at schools.

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Experience And Challenge Of Teaching& Learning Of Chemistry Disciplines In English At Buketov Karaganda State University

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Abstract
This paper is considered realization of multilingual education for students of Chemistry Department of Buketov Karaganda State University. Students 'educational track includes Basic English, English for Special Purposes, and then some chemistry and engineering disciplines in English. Challenges and ways of overcoming the difficulties connecting with lack of chemical and technical English were shown. Application of interactive lecturing is established to engage students with Kazakh and Russian mother tongue in learning in English and allow trainees to transform from passive recipients to active participants of educational process.

INTRODUCTION

In terms of integration of economy and science of different countries the future specialists - builders of new economic relations should possess both professional skills and knowledge of foreign languages.

Kazakhstan is now educating its children in the three official languages of the country: Kazakh, Russian, and English. Kazakh is the State and an important heritage language. Russian is an important historical language of the Central Kazakhstan region. English is the language that will allow Kazakhstan becoming a world player. Now English is the global language - the international language of diplomacy, business, science, education, and technology. It is important for students of many countries, Kazakhstan as well, to have a solid, active knowledge of English in order to communicate with the rest of the world [1, p.19]. In order to improve the quantity and quality of English language instruction, there are three main areas on which Kazakhstan needs to focus. First, English needs to be taught in English. The English classroom needs to be an English language-rich environment. Second, students must have ample time to improve both their accuracy and fluency in English. It's not enough to just study grammar and take tests. Students need to be able to actually use English in real situations, using all skills - listening, speaking, reading, and writing - equally well. Finally, classroom activities and learning materials need to be personally and professionally interesting for students. Today's students are focused on the future. English language training

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should be directly related to the specific linguistic competencies needed in the modern workforce. With the world so interconnected, English is the common language of our planet. Kazakhstan needs to be able to fully participate in all the world's affairs. English is the key.

In this regard the leadership of our country poses challenges for educational institutions for qualitative English language training of personnel demanded in future for various fields of national economy. President of Kazakhstan Nazarbayev highlights that trilinguism is obligatory for young generation. He explained that in the world a huge amount of scientific and technical literature is published in English and not the entire amount is translated into Kazakh and Russian languages. According to the President, young people need to know Kazakh as the official language, Russian as the language of interethnic communication, and English as an international one.

Karaganda State University named after E.A. Buketov (KSU) is one of the leading high educational institutions of the Republic of Kazakhstan where the training of future specialists at the fourteen departments is carried out in two languages such as Kazakh and Russian. Some years ago our University began training students in the framework of multilingual education which provides for the simultaneous teaching& learning of students of several departments, including Department of Chemistry, in three languages such as Kazakh, Russian and English. Now we would like to share our experience and challenges we face in educational process.

THE STUDY

Multilingual training in the framework of educational experiment is introduced for students training in such specialties as “Chemistry”, “Engineering of Organic Compounds”, “Engineering of Inorganic Compounds”, and “Engineering of Pharmaceutical Manufacturing”. Students’ mother tongue is Kazakh or Russian. Usually students' knowledge of Kazakh and Russian is sufficient for the study of chemical disciplines so the problem is in elaborating effective technique of teaching chemistry disciplines in English. Teachers of our Department who works within this educational experiment have diploma of two higher education, namely in the field of chemistry, or engineering, and as English teacher. In 2013-2014 educational year some of them were lucky to pass fortnight internship in England in the framework of courses arranged by Republican Institute for Development of Leading and Research Pedagogical Staff of Education System of the Republic of Kazakhstan, the branch of JSC "The National Center for Professional Development "Orleu". We successfully completed “Enhancing Learning and Teaching in Higher Education” programme at Newcastle University. We made acquaintance with modern approaches for teaching& learning in Higher

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Education, modern educational technologies and teaching techniques and now we apply knowledge, skills, and attitudes obtained in our teaching practice. As University teachers we hope our activities should be productive and useful, we constantly find ways of making students learning successful, and we are sure the continued professional development is absolutely necessary for each teacher.

Most of lecturers of KSU Chemistry Department are experienced and enthusiastic persons familiar with modern approaches to interactive methods of teaching and active learning. Active learning concerns the idea that trainees are actively engaged in the learning process rather than passively absorbing lectures materials. Active learning involves discussion, problem-solving, presentations, group work such as buzz groups, role plays, brainstorming, debates – anything that gets students interacting with each other and engaging with the lecture material delivering by teacher [2, p. 209]. It is very important to encourage students to take part in discussion, for instance, because such approach help shyer students or students with a lack of fluency in spoken English to participate more actively and reduce problem of session being dominated by some confident students good in English.

We think the teaching of disciplines in English at KSU Chemistry Department has its own particularities because Bachelor and Master Students attend lectures, carry out laboratory works and make assignments for their self-study as well. We consider teaching& learning of chemical disciplines namely in English requires development of all students' communicative skills at professional level.

It is obvious that student can easily and successfully acquire new knowledge if training moves from simple to complicated material. And educational track in studying English on professional level at Chemistry Department helps students being ready to be taught disciplines of chemical profile in English [3, p. 404].

Now we have some experience in conducting English classes for Bachelor Students of KSU Chemistry Department and point out some peculiarities in teaching& learning students. So for first five semesters they study Basic English and English for Special Purposes. During this module they acquire practical skills in reading and translation of English scientific& technical and chemical literature. Students' learning outcomes mean that they are able to analyze special texts, study the grammar, lexical and syntactic features of language of science

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and technology. Students are able to operate on various complex terms and terminological word combinations in English, they are prepared to study the subjects of chemical profile in English, they listen to and write down lectures, participate in seminars, carry out laboratory works and etc. At present time some special disciplines such as “Macromolecular Chemistry”, “Technology of Medicinal Polymers”, “Chemistry& Physics of Polymers”, “Chemistry and Technology of Synthetic Medicines”, “Basics of Biochemistry”, “Food Chemistry” and others are delivered for multilingual students of Chemistry Department. In future we plan the best students taught at this department will write diploma projects in English.

But when training in English we face a serious challenge. Do our students really comprehend material delivered by teacher? Are they actually engaged in learning? Examining students’ knowledge shows some deficiency. For overcoming challenges in training students of Chemistry Department our University teachers use modern innovative teaching methods and set goals that should be SMART. It means that we intend to focus on chemical disciplines teaching in an appropriate way. Courses structure should be remade for learning outcomes designing, elaborating other types of assignments, especially for multilingual students and Master students, changing forms of students’ assessment, getting feedback and as a result we expect the success of teaching& learning for them.

When delivering modules in English for students whose mother tongue is not English we consider that lecture plays a very important role because the lecture as an effective link of the educational process is closely connected with other types of sessions, especially with seminars, practical and laboratory classes, where students expand and deepen their knowledge in the self-study process. Typically, during the lecture problem-solving situations are created by lecturer aiming to activate students’ learning activity. Students do not have the knowledge or the means of the activity to explain the facts and phenomena, to hypothesize, to solve this problem situation. This method contributes to the formation of techniques of mental activity, analysis, synthesis, comparison, generalization, establishing causal relationships. Method applies discussion on issues that require reflection, so that students can express their opinions freely and listen carefully to the speaker. Thus, the interactive lecture is a training event with the following active learning features as facilitation, controlled discussion or conversation, moderation, slide show or educational films, brainstorming, motivational speech. Such lecture got students involved and thinking for themselves [2, p.214]. Interactive lecture provides an opportunity for students to work individually, in pairs or in small groups. Properly organized

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lecture allows the lecturer to see how well and quickly students acquire training material offered to them. As our students are taught in English which is foreign language for them, we start the lecture with a question or set of questions for engaging students in discussion. This can convert students from 'passive receivers' into active learners. We apply various types of interactive lectures such as problem-centered, sequential, comparative, story-telling, and so on. Many lectures are made as PowerPoint presentations with handouts of slides; each slide has key points of lecture material. Usually handouts have blank space to give learners possibility to make their own notes. Students are encouraged to be more attentive in lecture, to think critically and formulate their thoughts. Sometimes lecture is strictly structured, have logical sequencing of points and provide comprehension of material delivering by teacher. Such lectures help students to see interrelations with previous lectures of the module. Some lectures are constructed in free manner for making students freedom for expressing their ideas, encouraging their creativity and spontaneity.

In addition to classical and interactive approaches in lecturing short excursions are thought to be another important way of rising students' interest to learning. For example, when studying discipline "Chemistry and Technology of Synthetic Medicines" students of specialty "Engineering of Pharmaceutical Manufacturing» and lecturer can visit laboratories and plants of International Scientific-Production Holding 'Phytochemistry', Karaganda, and see the whole process of producing synthetic medicines, from preparation of initial compounds to obtaining ready medicines. Actually lecturer explains topic issues in situ showing the real process of drug manufacture.Moreover students see perspectives for further employment and their learning becomes deeper. Learners' interest to discipline rises.

Short videos also can stimulate students' interest. Such way of introducing lectures helps to maintain students' attention during lecture. We consider it is useful to arrange discussion of video contents after watching. We have experience in usage of short video clips for delivering lectures on "Macromolecular Chemistry" and notice that students' attendance of lectures increases.

Another important part in teaching& learning process is students' self-study. As usual students are offered list of topics for carrying out written assignments. Information search, processing and analysis always take place before the completion of written assignments. Students can face difficulties because of some lack of special topics terminology in English.

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In many cases they have to translate English material in Kazakh or Russian for better understanding. Teacher's guidance of students' self-study is necessary for completing various kinds of written assignments with success.

Oral presentations made by students of multilingual department are welcome as they develop greatly students' communication skills which are very much valued in life. For the future job it is important that students can express themselves well, i.e. inspiringly, convincingly and professionally. Students have the chance to orally present their written work, providing them with good practice on presentation skills. Oral presentations communicate information, experiences, opinions and thoughts and are an integral part of studies. Students are encouraged for speaking and listening to special English. Discussions arranged after presentation allows involving even shy and silent students in learning process.

Feedback between students and lecturers of our Department is absolutely necessary for successful teaching& learning process and it is constantly carried out by different means. Teachers analyze students' answers, opinions and points of view and therefore can improve training chemistry disciplines in English for achievement of better learning outcomes.

CONCLUSIONS

Finally we would like to conclude that definite system of students' training in English was created at KSU Department of Chemistry. After passing modules of basic and special English they are ready for studying chemical and engineering disciplines in English. We use interactive learning approach in educating students with Kazakh and Russian mother tongue in English. Graduates of multilingual department of KSU are demanded for many enterprises of Karaganda region and all over the country.

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Exploratory Needs Analysis Towards Graphic Design Learning Module Based On Technology & Learning Styles For Deaf Students

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Abstract
Deaf students are not excluded from the current mainstream education since "education for all" term applied. However, the curriculum does not cater to the needs to hearing-impaired students. The aim of this study was to identify the needs of deaf student towards graphic design learning module based on technology and learning styles in Special Education Secondary Vocational School (SESVS), Shah Alam, Malaysia. Semi-structured interviews with five special education teachers and five deaf students covered the needs, technology and learning styles in graphic design education. Gagne's nine events of instruction model was integrated to develop a prototype module and was tested retrospectively to look at the usability of the learning module. Results showed that teachers and deaf students were satisfied in using the technology-based learning modules and learning styles for graphic design and this suggests a strong potential to be implemented to other institutions that offers graphic design program for deaf students.

Keywords: Graphic design, deaf, hearing disable, SMPKV, Gagne, retrospective, technology, learning style

INTRODUCTION

Hearing impairment is the inability of a person to hear. Deaf community can be categorized into two types, namely the hard of hearing and deaf. If someone could not hear then it is classified as deaf (World Health Organization, 2014). Deafness can be caused by several factors such as inherited, mother's rubella and birth complications result from infections such as meningitis, ototoxic drug, exposure to excessive noise and age. Some of the factors mentioned above can be solved using the latest technology such as hearing aids, FM systems and Cochlear Implants.

More than 5 percent of 360 million people worldwide have hearing problems (World Federation of the Deaf, 2014). In Malaysia, it is estimated that 1 percent of the Malaysian population is categorized as the Persons with Disabilities (Orang Kurang Upaya or OKU), which is 387 thousand and one hundred and forty-nine (Ministry of Education, 2013). From

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this number, it is estimated that around 55 thousand people have been registered to be Bahasa Malaysia sign-language users (Harrington, 2010). Malaysia has lower deaf population compared to other Asian countries such as Indonesia (2 million) and Japan (7 million) but still higher compared to other Asian countries such as Thailand (54 thousand), Taiwan (30 thousand), Sri Lanka (12 thousand), and Singapore (three thousand).

In most developing countries, the presence of deaf citizens leaves an impact on the national economy. This happens because deaf children do not receive proper education (World Health Organization, 2014). Deaf adult citizens have problems to get a job because of inadequate skills and failure to communicate well and do not have the qualifications required by employers. Most deaf citizens have a low percentage of academic qualifications compared to normal citizens. Hence, it is important to enhance learning opportunities, vocational skills and awareness among deaf community in helping them to be equally and successful in education.

Special Education

Attention to special education has been emphasized since the declaration of universal human rights in 1948, which affirms the right of every individual to education. This issue was reaffirmed in the conference's theme of 'Education for All' in Jomtien Thailand (1990). This conference stressed on the learning needs for disabled people, needs and special attention. Gradually, various steps have been implemented in providing equal access to education for the disabled as part of a unified education system.

Based on the Salamanca Statement and Framework for Action on Special Need Education (1994), most high education systems have adopted an inclusive approach to special needs students. This declaration states that students with special needs must have access to mainstream education. Mainstream schools that adopt inclusive education environment, must be able to create communities to support special education and build an inclusive society. Parallel to Article 28, Persons with Disabilities Act 2008, it certifies that a student with special needs should be given support to help them achieve "full participation and equality in education". Based on international best practices and current national policy, the Ministry of Education Malaysia aims to encourage more pupils with special needs in inclusive education program, and improve the overall quality of their provision.

The Ministry of Education Malaysia has established a special education program for primary and secondary school. In Malaysia Education Development Plan 2013-2025, the

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government has provided options for deaf students wether to follow the Special Education Schools, Special Education Integration Program, or Inclusive Education Program. Neverthelss, the planning for tertiary levels such as Diploma, Degree, Masters and Doctor of Philosophy (PhD) is still inadequate (Roslida Alias, Alias Nor Aziah, Abu Bakr Ibrahim, Halimaton Atan, & Azman L Kadir, 2012).

Special education philosophy aims in providing equal opportunities to special children who were given to normal children for psychosocial development (KPM, 2013). This philosophy is aligned with the objective to ensure that the needs of working people and the education system can meet the goals of the State towards creating a society that is united, disciplined and well-trained (Sufean Hussin, 2008).

According to Mohamad Sazali Shaari (2013), the director of Malaysian Federation of Deaf (MFD), there are more than 50 thousand citizen who registered as deaf citizens but less than 20% have furthered their study in the local university. Arguably, students who wish to pursue in local university do not have special guidelines for deaf students (Imran, 2014; Boswell, 2014; Zarimah, 2014; Vikson, 2014; Masrinah, 2014). However, there are students who have enrolled the program at the local university level, but it is out of their own ability. Students who wish to further their education should strive to find appropriate education and institutions with field of endeavor.

In contrast to the situation that occurred outside the State (United States of America), there are universities that provide special programs for students who want to continue their education to a higher level. Gallaudet University is the world leading university in liberal education and career development for deaf students. This university has served over one hundred and fifty years since 1864. Among the programs offered are Media Arts, Digital Media, Graphic Design, Photography, Art Studio and many others. Appropriate teaching and learning methods were employed to suit their learning needs.

Graphic Design

According to a study conducted by Zaharudin, Nordin, & Mohd Yasin (2011), the demand for Informaton Communication Technology (ICT) programs such as graphic design, website

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design, animation and multimedia application design is preferred by deaf students which is offered at Gallaudet University. According to a survey, students are interested to graphic and multimedia design program because it uses visual representations rather than verbal because students are able to communicate information through visual platform.

Malaysia have several public and private institutions that offer graphic design program, but with very limited programs offered to deaf students. Institutions cater to deaf students to pursue graphic design program are Universiti Teknologi MARA (UiTM), Polytechnic and Limkokwing University. Based on students' blog and interviews, they have problems in learning processes and practices (Veerakathy, 2007)

In Malaysia, there are over 111 programs in Graphic Design (Malaysian Qualification Register, 2014). However, the construction of the program is accordance to the guidelines provided by the Malaysian Qualifications Agency (MQA) which includes the Code of Practice Accreditation Program (COPPA) but, not focussing on the needs of deaf students. According to the Education Act 1961 and Education Act of 1966 which is subject to Subsection (2) and (3), namely:

(2) The curriculum used to be connected with special education

(3) The curriculum prescribed under paragraph (1) (b) shall comply with the requirements of national curriculum as far as reasonably practicable.

Apart from the Education Act 1961 and the Education Act 1966, the national education policy also outlines some interest to the special education curriculum which are;

(A) To ensure students with special needs are given the opportunity to have access to appropriate and relevant education.

(B) Ensure the special education program for students with special needs are relevant to their ability to become independent, and live a quality of life.

(C) Ensuring potential students with special needs are given the opportunity to be placed inclusively in the classroom accordance with the principle of education for all.

(D) Provide access to quality education, relevant and appropriate for students with special needs.

(E) Provide more opportunities in the field of vocational

(F) Provide equal opportunities to students with special needs have the potential to excel in mainstream classes.

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(G) Implement early intervention for children with special needs from preschool or services at the Center for Special Education Services (3PK).

(H) Provide support services, augmentative and assistive equipment to meet the needs of students with special needs.

(I) To provide teaching and learning materials are sufficient, current and accordance with their capabilities and needs of students with special needs.

(J) Ensure adequate trainers, trained and skilled in the field of special education.

(K) To strengthen the use of Individual Education Plans for students with special needs.

The curriculum of graphic design program has been practiced since 1919. According to Stock-Allen (2013), School of Arts Bonjour is the pioneer in Graphic Design in German. Graphic Design is a course that combines two important core aspects which are cognitive thinking and motor skills. Mastery of these aspects will produce a credible graphic designer. However, it should be trained to ensure that the mind can be used quickly and accurately (The Netherlands, 2006; Ryan & Conover, 2004). Therefore, Graphic Design curriculum needs to touch minds and skills development in ensuring the prescribed learning outcomes are achieved. Although guidelines for implementing the curriculum in graphic design was clear, but the implementation of deaf students need to be further studied.

Technology In Learning

The use of technology has proven to be effective on deaf student's performance. According to Mich, Pianta, and Mana (2013), learning to use the interactive storytelling approach can provide higher understanding to students than conventional approaches. Students with hearing problems will be able tofully interact with the visual. This study was supported by Berent, Kelly, Aldersley, Schmitz, Khalsa, Panara and Keenan, (2006); Petrantonakis, Kosmidou, Nikolaraizi, Koutsogiorgu, and Hadjileontiadis (2008); Berent, Kelly, Ronald, Schmitz, Kathryn, Kenney, and Patricia, (2008); Barca, Pezzulo, Castrataro, Rinaldi, Caselli, and Maria (2013); and Narr and Cawthon (2011) which agreed that the visual presentation with the help of technology provides an effective learning for deaf students.

Video presentation is one of the effective feature of visual presentation, especially in providing repeatation in explaination. However, the use of video without audio required additional elements such as subtitles and translation (Al-Rousan, Assaleh, & Tala'a, 2009). Subbing also take some time for a long video. Therefore some other approach should also be

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taken, such as the use of software as a tool to identify the sound of which can be transferred from audio or text to 3D animations approach. By using this tool, teachers are able to pronounce words clearly identified so that it can later change it in text form (Stewart, Allan, & Harrison, 2010).

Another approach used for students who have hearing problems is video games. According to Kotnana, Solomon, and Jesudoss, (2010) and Gaber, Abdelbaki, and Asme, (2011) video games can stimulate learning resources to students who have hearing problems. Various needs that can not be prepared using conventional methods have been resolved with the use of this approach. It also can reduce the gap between students who have hearing problems with students who have no hearing problems in the context of teaching (Chang S. Nam, Sangwoo Bahn, & Raney Lee, 2013); Nikolaraizi, Vekeri, & Easterbrooks, 2013; Hameed & Don, 2007; Bottoni, Capuano, De Marsico, Labella, & Levialdi, 2011;Jemni & elghoul, 2008).

Study on Graphic Design using educational technology approaches has the potential in enhancing learning. Graphic Design field is potentially impactful on deaf students in reducing the gap of learning in comparison to normal students. The significance of this area of studuy is not only restricted in Malaysia but also in the United States of America.

Learning Styles

Studies show that deaf students have learning difficulties because the methods used by teachers were also unsuitable to the style of student learning. At the school level teachers have the skills to use sign language to communicate with deaf students but at the tertiary level students need to have a translator as teachers or lecturers do not have the skills to use sign language. Furthermore if the program is designed for those who are normal, students who have hearing problems need to seek alternative solutions in understanding what they have learned.

Identifing the unique learning style is very important to ensure that students are engaged in the learning process (Naimie, Siraj, Ahmad, Abuzaid, and Shagholi, 2010; Graf, Kinsyuk, and Liu, 2009; Larkin-Hein and Budny, 2001; Yang and Tsai, 2008). Results of the past studies revealed that acknowledging students' learning style will improve student performance as well as their motivation (Aviles and Moreno, 2010; Franzoni and Assar, 2009; Lau and Yuen, 2010; Saeed, Yang, and Sinnapu, 2009). Each student has his/her own learning style.

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According to Peterson, Rayner, and Armstrong (2009), learning style is the approach chosen by the student learning while Dunn and Dunn (1978) felt that it is a way for students to concentrate on learning that he will able to understand and remember some skills and new information effectively.

In addition, Slavin (1994) believes that individuals who have different personalities definitely have different ways learning styles. Similarly, Gregor (1985) explains that each individual is born with different learning styles. He added that the family heritage and environment play an important role in the development of individual learning styles. Dunn and Dunn (1978) claimed that learning style helps us to concentrate, understand and recall information or to master certain skills efectively. He added that there are five elements of the stimulus, namely environmental, emotional, social, physiological and psychological impact on an individual's ability to learn, interact and respond to the learning environment.

THE STUDY

The current study employed semi-structured interviews with five teachers and five deaf students who undergone the graphic design program in SMPKV, Shah Alam. This interview is to identify the needs of the graphic design learning module based on technology and learning styles. Researchers used semi-structured interviews and interview protocols because the interviewer can ignore some of the question which deemed unsuitable or added according to needs (Robson, 2002). Each teacher was interviewed individually so that their opinions are not influenced by other teachers. On the other hand, the students were interviewed in groups because researchers need to use the services of an interpreter at the same time. The interview data were recorded and then transcribed thematically by using Microsoft Word 2013.

Interview was based on the research question: what is needed in designing graphic design learning module based on technologies and learning styles for deaf students. Data analysis and discussion of the findings accordance to the following themes:

- Graphic design as a selective courses among deaf students
- Learning Technologies as an effective teaching method
- Deaf learning styles
- Learning Module based on technologies and learning styles

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Graphic design as selective program

The first theme, researcher discuss about graphic design as selective program among deaf students. Deaf students are more likely to choose graphic design compared to other programs because graphics use a lot of visual perception and psychomotor skills. In addition, the use of computer graphic in education is one of the deaf students' interest in school.

Deaf students learn the graphic design compared to many other courses. Deaf students happily working with computers instead of humans. They don't have problem communicating with the computer. They can communicate with other people by using computer. Deaf students really interest on graph. Just give the task and they will finish it. (GK4: 100)

Deaf student like graphics to visualize. The important thing the messege is there. In terms of reading I feel really low... (GK2: 19)

Eventhough deaf students are more likely to choose graphic design program, there are also some who have majored in another program because graphic design only offered in selected schools and some schools were too far from them.

Students actually take less graphics due to several factors among which are far ... (GK5: 3)

Technology as an effective learning tool

Second theme, the researcher focused on the use of technology in learning and will discuss the related sub-themes. Results of interviews with teachers found that the use of technology in learning is absolutely necessary especially for deaf students. With the lack of hearing technology-based teaching methods attempt to solve the communication problems of deaf students, they also have communication problems with normal students in school but also have communication problems with their parents.

Technology can also help communicate with students ... (GK5: 39)

In terms of communication ... student have problem ... Not only in education but also in the family there is a problem ... (GK4: 6)

Parent who have deaf children do not want to learn sign language ... (GK4: 60)

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Apart from helping the communication with deaf students, technology is able to attract attention and help students and teachers in teaching and learning. Multimedia is one of the elements based on technology that includes video, audio, text, graphics and animation. Although the audio element can not be used, but other elements exerted great influence in helping deaf students' learning.

Deaf students likes to study using multimedia... multimedia is friendly than a human ... because they feels they can interact with the computers... (GK1: 10)

Ok, nice, if you want to develop graphic design learning modules based on technology and learning styles for deaf students because our educational system is not on their side so ever ... (GK1: 5)

In different countries, I saw a university when he spoke, text will roll out. So deaf students can read the text ... in learning. But in Malaysia we got have to think of a more efficient method ... (GK1: 43)

Actually teacher can create lesson from the outset ... provide translation and recorded a video then there is somebody who interpret ... There are students who do not usually read the instructions via text because he received instructions through sign language... (GK3: 16)

I definitely agree with the use of technology in teaching deaf students. Apart from technology, teacher use Powerpoint ... But I think if we want to help deaf students use narrative video. (GK2: 50)

I think video is the stronger method to teach deaf student. Teachers should know the student better. (GK3: 24)

If the software that emphasizes on visual and it might be appropriate...share hands-on video and then create a discussion with students if there are questions. It is one of the blended learning concept ... (GK5: 52)

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Apart from the use of multimedia elements, the use of technology as a platform in the learning of deaf students like Web 2.0 can help better learning. There are also teachers who suggested that technology-based learning courses not only for graphic design program but need to be practiced in other program. Among the teacher's response as follows:

Web 2.0 is good for learning especially Voicethread ... (GK2: 46)

I think all courses should necessarily use instructional technology but either completely useless or not depends on the course itself ... (GK5: 34)

Although the technology has shown interest in deaf student learning but is still at the stage of lackluster implementation. Not all schools are willing to use the technology as a whole. There are teachers who are frustrated because schools are not supplied special computer for deaf students and teachers have to provide technology needs on its own initiative. Among the teacher's response is as follows:

I feel disappointed with the education system for deaf students ... (GK4: 39)

Trend of education system needs to be changed ... (GK4: 61)

Whether implant or wear a hearing aid ... The problem is money, hearing aids are expensive. Although the social welfare department will provide them but these tools must be maintained ... (GK4: 15)

Learning modules based on technology and learning styles

The last theme is learning modules based on technology and learning styles. Teachers argued that the existing education system is categorized as a failure because it did not consider learning styles. While technology in learning has occurred but deaf students' learning styles approach is still not being properly practiced. Teachers agreed that a special module should be developed specifically for deaf students in accordance with their needs. Learning module based on learning styles for graphic design courses have not been established because teachers do not have the ability to produce them. With this approach, deaf students are able to learn more effectively. This module is not necessary for graphic design courses only, but

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should also be developed for other courses as well. Among the teachers' opinions are as follow:

Education system that we try to apply to our students is failing. Because we only rely on one method. Many other potential methods to help them ... (GK4: 29)

Actually this is an appropriate way of learning for deaf students. Now people are not waiting for things like this. But not only the graphic ... means all courses can use this method ... (GK1: 35)

Module that considers students' learning styles do not exist yet. Which is very nice. It is not the technology but the instruction method ... I think deaf have their own learning style. So you need to find the type of learning style ... (GK3: 52)

Whatever information contained in the module it must have interpreter. Not only for the video content. Any information should be included in the workplace. Then this module is deaf friendly ... (GK1: 16)

Not for learning graphics only but they can apply in near future. They got to practice what they learned ... (GK4-74)

We should use learning modules based on technology and learning styles. They can learn this way. (GK1: 38)

If we properly manipulate this, deaf people will go far ... (GK4: 32)

Student Interview

Researcher interviewed a group of students. Interview questions focussed on the learning module based on technologies and learning styles for graphic design program. Students stated that they never use a special learning module based on technology and learning styles. Teachers usually use sign languages and teaching aids such as a whiteboard as a rutine.

Teachers use sign language when they teach. But the teacher never use a special module to teach us. Instead, we are forced to find our own initiative... (PK5: 22)

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Students agreed on special learning modules should be developed but must also provide certain requirement, such assign language video in explaining all content in the module. Students also agreed that the use of technology can help communication between normal students because the school applies inclusive concept which combining deaf and normal students in one class. There is one student who prefers to have text and and sign laguage in teaching and shows the different learning styles accured.

I strongly agree that the Learning Module in Graphic Design with technology-based and learning styles used. I feel so great because never use the module before ... (PK1: 4)

Prefer sign language video. Can read and understand sentences quicker but understand sign language better... (PK2: 9)

I prefer text to video...(PK3: 14)

I used to have a class with a normal students but I did not understand what the teacher taught because of communication problems. I want to ask a question but my friend can't understand sign language. No special module is used for deaf students so far... (PK1: 28)

It is better if there is a video that explain in sign language because if you do not understand then you can repeat until comprehend. It is easier ... (PK3: 34)

From the aspect of learning style, the students' feedback indicated that they are more likely to use visual learning and global, which are more geared to know the whole content first before studying one by one.

I prefer to learn a big concept like a map form. Can see the a whole picture of learning. Easier to understand than learning one by one and finally got to know what to do ... (Pk4: 38)

Prototype

After receiving feedbacks from the interviews with teachers and students, researchers have developed a learning module prototype for graphic design program based on technologies and learning styles. Researcher chose one of the basic topics on how to create interactive buttons

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using Adobe Flash CS5. This learning module also adapted visual learning style, where all the explanations and instruction will be recorded with interpreter, subtitle and annotation. This module was developed using Wordpress 3.0 platform while the instruction model based on Gagne 9 events. Figure 1-17 below shows the visual of learning module based on technology and learning style for graphic design prototype.

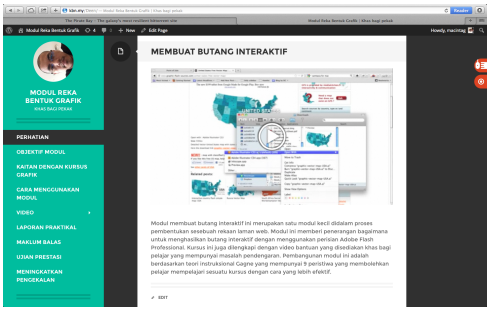


Figure 1: Gaining attention

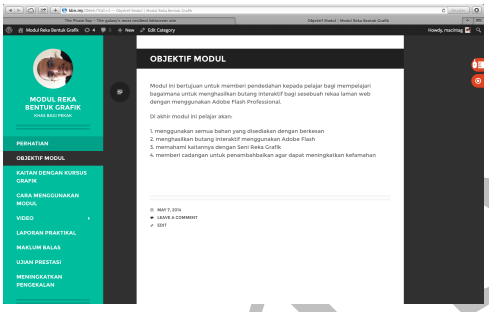


Figure 2: Module objective

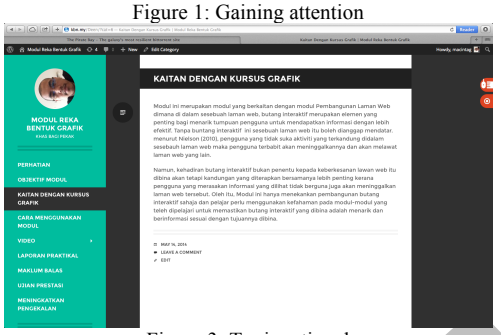


Figure 3: Topic rational

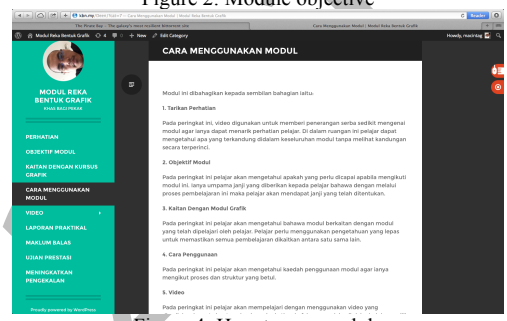


Figure 4: How to use module

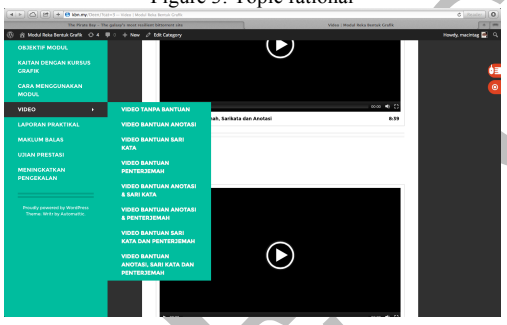


Figure 5: Video clip

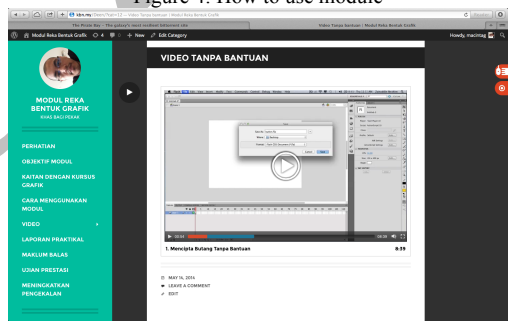


Figure 6: Plain video

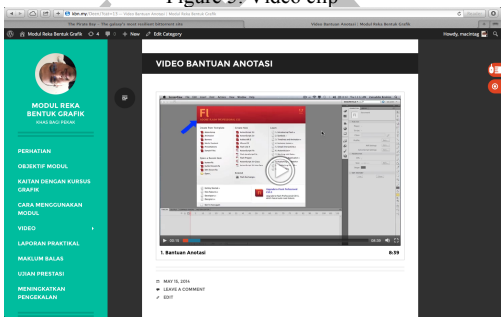


Figure 7: Video with annotation

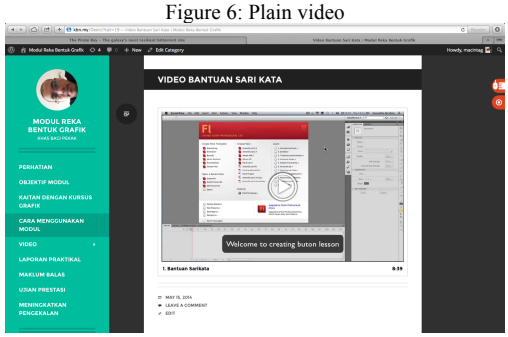


Figure 8: Video with subtitle

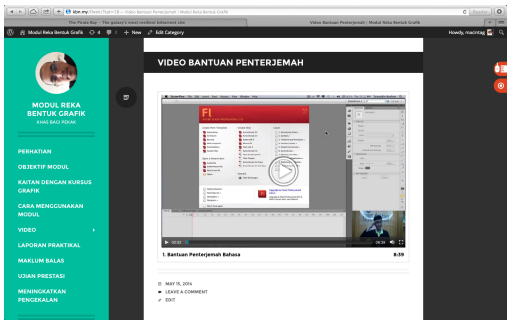


Figure 9: Video with interpreter

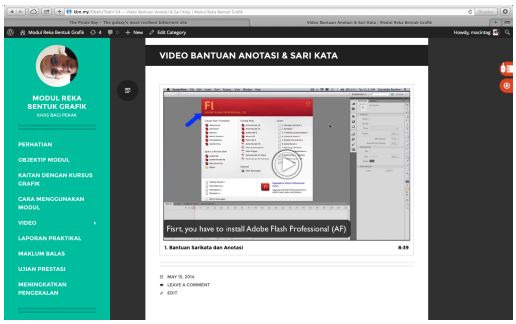


Figure 10: Video with subtitle and annotation

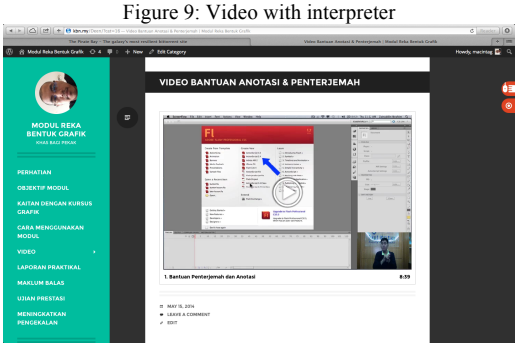


Figure 11: Video with interpreter and annotation

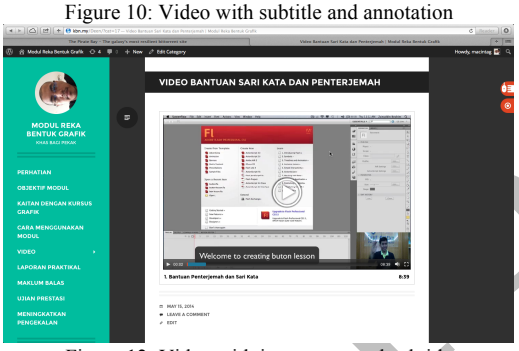


Figure 12: Video with interpreter and subtitle

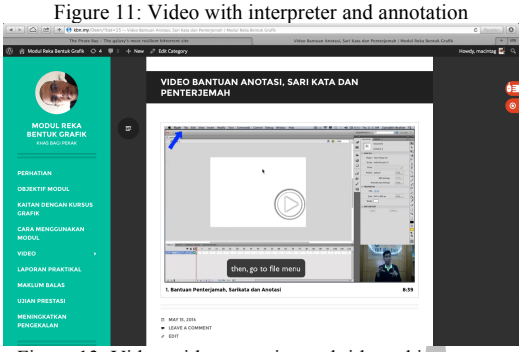


Figure 13: Video with annotation, subtitle and interpreter

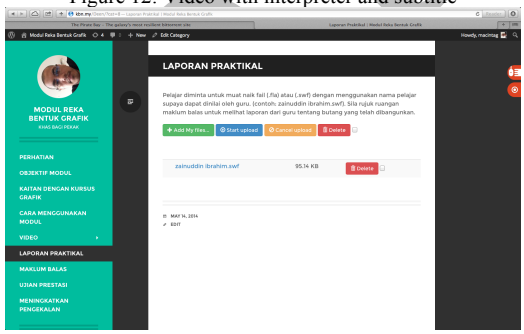


Figure 14: Submitting artwork

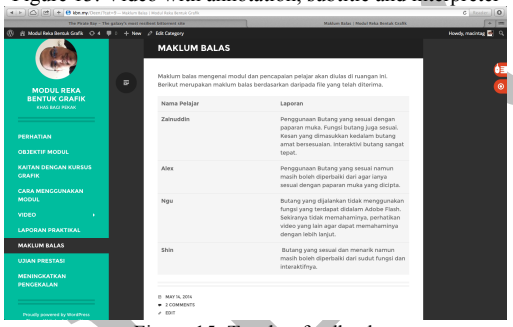


Figure 15: Teacher feedback

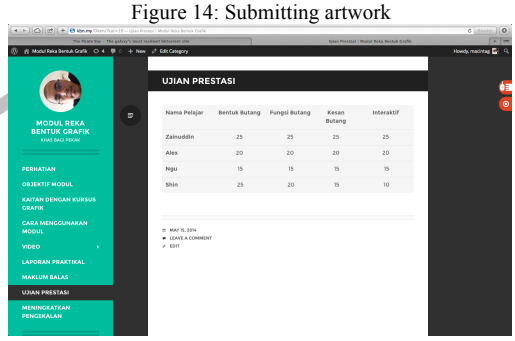


Figure 16: Result

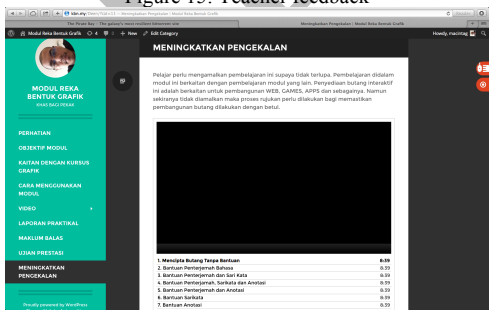


Figure 17: Continues learning

Testing

Retrospective testing was conducted in Special Education Secondary Vocational School (SESVS) computer lab on five deaf students who take graphic design courses. All students were provided with the Apple Imac G5 together with Adobe Flash CS5 software and Internet connection. Students were briefed on how to use the learning module by their teacher. Students must complete assignments after using the modules. Students were given one hour to study a given topic, and another hour to complete the task. Each task should be uploaded into the module provided for evaluation by teachers appointed.

RESULT

After completing the assignments and uploaded them, all student were called to another room to get their retrospective respond on the use of learning module based on technology and deaf learning styles for graphic design sub topic. Similar question from the semi-structured questions were used as guidelines, which include :

a) Does this module is required for graphic design courses?
b) Does the technology used can help learning?
c) Does the visual learning style is suitable for use in the learning module?

a) This module is required for graphic design courses

Students' responses indicated that they required learning modules for graphic design based on technology and learning styles for deaf students. The learning process was effective than conventional methods of learning. Students mentioned that the school already provided a Virtual Learning Environment (VLE) Frog, but teachers only uploaded the notes. Collectively, they agreed that the proposed intervention is relevant as the learning process will be efficient and more effective. For instance, one of the respondent mentioned that:

"It should be like this... it's very fast and nice (RPK1: 3)."

b) The technology used can help learning

The integration of technology in learning has been practiced in schools with the use of computers and projectors, but the teachers only explain the topic using sign language and will only use a projector to show the content. On contrary, the current intervention applied videos with sign language, annotation and subtitles, in aiding their learning needs. They can

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repeatedly view and study the video at ease. This agrees with drilling practices in helping to maximizing understanding and reinforcing the content of learning.

"The technology is very helpful because it is better than the old concept of learning that is based on using only sign language (RPK1: 5)."

c) The visual learning style is suitable for use in the learning module

In terms of learning styles, the deaf students were more inclined to the visual rather than verbal inputs. However, they preferred video rather than the picture because it is more interactive and comprehensive. In addition, the video contains a translator in explaining the topics, and subtitle and annotation are also available if necessary. For instance, one of the participants expressed that;

"Video is easier to understand than the use of text and images even if the image is also on visual formed (RPK2: 7)"

On the other hand, the assignment will be uploaded on the learning platform and the teacher can easily assess their work progress efficiently.

CONCLUSION

The above results indicated that the graphic design learning module based on technology and learning styles for deaf students is potential and relevant in providing an effective learning setting for students and teachers. The use of technology such as computers, Internet and video help to simplify the learning process of deaf students. In addition, the use of the Web as a platform for learning modules helps to facilitate the accessibility of the information (Drigas, Vrettaros, Tagoulis & Kouremenos, 2010). On the other hand, visual learning style is a style that is very effective in teaching deaf students but teachers need to ascertain whether the requirements of the appropriate content to be delivered. The use of interpreters, subtitle and annotation in the form of a video to explain the topic can help deaf students to comprehend the learning effectively. This is consistent with the statement of Marchark, et. al., 2013; Krause, Kegl, & Schick, 2008, who mentioned that the presence of a translator is very important for communication of deaf students. In this study researchers used the instruction model Gagne 9 events and only focus on one learning style, focusing on visual input only. We

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suggest that for future studies to use a variety of instructional model emphasizes learning styles and other category of processes, perception and understanding. We also suggest that broader topics in learning should be explored in evaluating the usability and effectiveness of the proposed model.

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Exploring Cognitive Coaching Techniques In Creative Writing By High School Students: A Technology-Enhanced Approach

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Abstract
This paper is a report on an exploratory case-study which investigated the effects of cognitive coaching on creative writing by high school students. The study applied insights from creativity research and the impact of peer-collaboration to explore whether student writers can benefit from explicit instruction in cognitive coaching. By applying insights from cognitive literary theory concerning the creative mind of the author and the inquiring mind of the reader, this study investigated whether a classroom teacher can stimulate the verbal creativity of student writers though a sequence of lessons and activities designed to elicit improved narrative writing in a classroom setting. Applying new collaborative computer technology tools, such as iMac computers and Google applications, the study found that student enjoyment of the creative writing process and the self-perceived quality of their stories increased though the use of cognitive coaching and by integrating technology more smoothly into the writing classroom.

Key words: cognitive coaching, collaboration, creative writing, distributed cognition

INTRODUCTION

Creativity research in the past twenty years has offered many new insights into how the human brain has evolved to continually generate new ideas, test them to assess their usefulness, and then share them if they are valuable (Simonton, 1999). Valuable creative works, in arts such as creative writing or technological inventions, lie at the heart of innovation and drive new achievements across all disciplines, and therefore are increasingly important in educational programs. Educators are becoming more aware of how the human brain creates and how the human mind is affected by social environments (Andreasen, 2005) as researchers (Richards, 2007) have shown that everyday creativity can truly be enhanced in all students by explicit classroom instruction and discussion of what cognitive processes lie behind the generation of creative works.

Learning to be more creative (Robinson, 2011) therefore has become an identifiable learner objective in educational programs from early childhood through secondary school. This insight

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has opened new teaching approaches, particularly in lower-secondary school instruction, where students may have developed a fixed mindset that 'they are not creative' as if creativity were a static trait that one either possessed or didn't. Teaching creativity techniques (Kaufman, 2009), particularly through collaborative projects, has recently become essential in best-practice schools around the world.

This research project on developing creative thinking in secondary school students emerged from an interest in the work of Mark Turner in *The Literary Mind* (1996) and *The Origin of Ideas (*2014) and Margaret Boden (2004) *The Creative Mind, Myths and Mechanisms,* and the neurological explanation of how humans create and blend concepts to make new creative ideas. These new, unfamiliar and yet interesting combinations of familiar ideas which writers create lie at the heart of good fiction, and exploring how these 'conceptual spaces' are created can be helpful in writing strong imaginative works. Recent work by cognitive literary theorists such as Mary Thomas Crane (2015) has shown how categories, or packets of thoughts/ideas, emerge in an author's brain, and are shaped by environment and culture, and then expressed as a literary artifact of notable cognitive achievement.

This case study asked students to consider where their ideas came from in their own short stories, and explore both the emergence of the ideas, and the subtle refinement of them through the process of revision, after receiving comments from a supportive peer. The flexible thinking associated with creative writing (Loetz, Erhard, Neumann, Eickhoff, & Langer, 2014) has been identified by creativity researchers as an essential feature of exemplar creative work, and this research project attempted to show students the cognitive processes behind their own creativity and how these processes can be enhanced.

Significantly, creative writing continues to grow as a critical part of English language teaching in recent years, both in school and university programs (Davidson & Fraser, 2009). One can notice the enormous increase in BA, MFA, and PhD programs in creative writing around the world—in the US alone, according to the Association of Writers & Writing Programs (2012), creative writing programs at the tertiary level increased eleven-fold from 79 programs in 1975 to 880 in 2012, evidence of the growing importance of creative writing and the significance of training students to use divergent thinking, take appropriate risks with new ideas, and build on what is previously known to synthesize new imaginative works.

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One important finding coming from this recent work in creativity research is the debunking of the myth of the 'solitary genius' (Pope, 2005). More accurately, we can see that people create their best work when there is interaction between producers and audience-- and creativity is enhanced when this interaction is magnified on a 'systems' level so that creators and those who read/evaluate their work are bound together in a tight, reciprocal unit. Here the work of Csikzentmihalyi (2014) who describes the 'flow' state of writers or other creators as they experience the positive rush of emotion in a social network can be illuminating to educators who may try to recreate such an environment within a classroom setting. Moreover, a substantial part of writing in the workplace is now done collaboratively (Bremner, Peirson-Smith, Jones, & Bhatia, 2014) and students who have experience in thinking and writing collaboratively will undoubtedly benefit from this early training.

The tipping point in astutely building an environment which encourages excellence in creative writing comes with the addition of technology tools that enhance such collaboration-- specifically in this study Google Docs and Google Classroom. Such computer-aided instruction offers teachers new avenues in developing "an atmosphere of possibility" (Laing, 2014) that can help teachers find ways to model the enjoyable excitement of writing in novel ways that will appeal to the digital natives of today's adolescents, who often love working with computers and social media. Integrating technology into the creative writing process reflects the widespread use of technology integration into all disciplines (Brossard, Hebert, Welch & Vanmetre, 2014), and has certainly become a hallmark of 21st century educational practice.

In short, by establishing an environment of tight collaboration and using techniques to build appreciation of creative imaginative work, teachers can help students create richer narrative texts and better creative fiction. Students can truly benefit from explicit instruction in the cognitive processes behind creativity (Onarheim & Friis-Olivarius, 2013), and therefore better tap into their own ability to write interesting, creative short fiction.

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LITERATURE REVIEW

Cognitive coaching, which can be defined as an intensive coach-student relationship aimed at the improvement of any skill such as athletic ability, teaching training, or business mentorship, has gained ground in recent years. Emerging from the work of Costa and Garmston, whose seminal book *Cognitive Coaching: a Foundation for Renaissance Schools, second edition* (2002)

described key attributes of successful teacher-educational coaching models, cognitive coaching offers a way of teaching and learning that relies on trust, rapport, and support between a 'coach' who thoughtfully and respectfully mentors and evaluates a work, and a 'coachee' who listens carefully and considers changes suggested by the coach. Crossing disciplines such as cognitive science and educational theory, cognitive coaching is one of the many new insights offered by researchers in brain science who seek to apply findings in neuroscience to practical solutions for learning and cognition.

More recently, researchers such as A. O'Broin (2009) analyzed the key features of optimal cognitive coaching, which includes empathy and mindfulness of the feelings and ideas between coach and coachee—neither one superior to the other, and both sensitively attuned to a beneficial collaborative spirit. However, this work on the psychological contract between a dyad of two minds does not specifically address adolescent students and their particular needs.

An interesting look at adolescent learners and benefits of cognitive coaching can be found in the work of Wang & Millward (2014) who developed a visual model of the dynamic processes of the social and environmental aspects of cognitive coaching, looking at effective questioning techniques by a mentoring coach with a student, and finding a need for extensive training for teachers interested in such cognitive coaching. This research project however did not specifically examine peer-collaborative coaching, but instead focused on the benefits of adult-student coaching relationships.

Perhaps most interesting, researchers in the Netherlands (Stevenson, Kleibeuker, deDreu, & Crone, 2014), investigated whether adolescents could be trained in creative cognition. Since students at this age of development typically show high degree of brain plasticity and flexible adaptation to their rapidly changing social worlds, could creativity and idea-generation increase with specific training in divergent thinking and alternate-use tests? This study suggested that explicit training can indeed be quite effective. Further work however needs to be done on the precise role of peer-feedback and exposure of ideas of peers, since adolescents "react differently to feedback from peers than adults" (p.14).

An extensive review of the literature therefore reveals an emerging body of relevant research on the effectiveness of cognitive coaching on verbal creativity and creative writing by adolescent learners—a promising research area for teachers interested in finding ways to incorporate recent advances in creativity research into their professional practice.

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METHODOLOGY

In order to reflect the key characteristics of the research question regarding the effect of cognitive coaching on creative writing, the study itself was designed to attract and intrigue the participants as much as possible, reaching out to the cognitive world of 16 year-old students in activities, ideas, and tasks that might resonate with them. Positive and supportive interaction between the teacher and students and among the student groups was emphasized throughout the study so that a dynamic "flow" state of mutual respect and good will could be achieved.

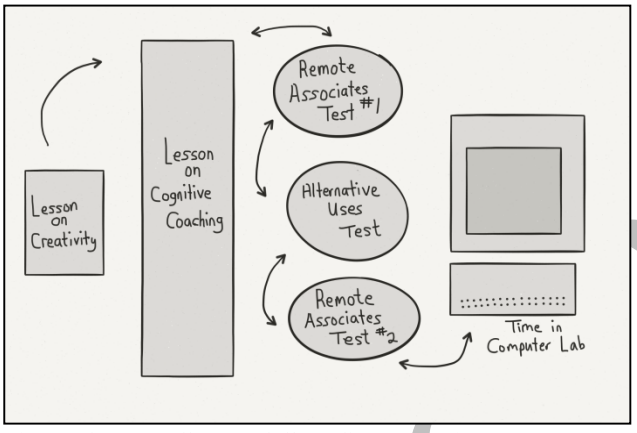


Figure 1, Flow Chart of Case Study Design

At the beginning of the study, the students were informed of the purpose of this research, following the British Educational Research Association's Ethical Guidelines for Educational Research (2011), and signed a permission letter giving them a chance to see the results and drop out of the study at any time if they wished (Appendix F). Student identities were protected by the use of aliases. To ensure transparency and interaction between the researcher and the member participants of the study, a Google site on "Cognitive Coaching in Creative Writing" was created and shared with the school community. This site included information on Research Plan, Data Gathering Tools, an extensive Reading List, and drafts of the case-study results.

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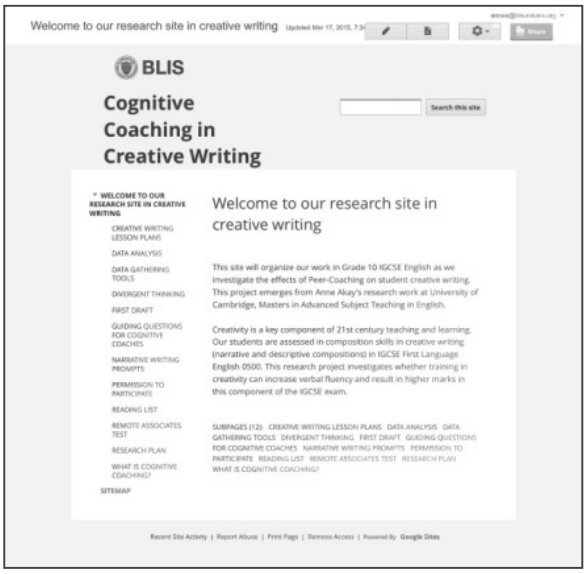


Figure 2, Google Site, "Cognitive Coaching in Creative Writing"

This small-scale case study involved a series of three lessons: the first on creativity and imagination, the second on cognitive coaching in creative writing, and the third on the role of self-reflection in the writing process. Briefly, the first lesson introduced the concept of cognitive literary theory by exploring how authors use imagination in creating their fiction. Students were informed of the brain's 'default mode network' where authors and creative thinkers day-dream about possibilities, remember past events, and think about future happenings—in other words, where ideas for good stories come from. The lesson emphasized that good stories often explicitly show the thinking process of their characters. The students then listened to an online narration of the 1955 classic children's picture book by Crockett Johnson, *Harold and the Purple Crayon,* where the author describes in a humorous way the thinking process of his protagonist as Harold navigates his story-world, and discussed the implications of this approach in their own writing.

The second lesson introduced students to 'cognitive coaching' and outlined the process involved in such a relationship between a 'coach' and 'creative writer.' Students were reminded that the project relied on them making a good effort to work together to create something beautiful—that they should be striving for 'neuro-coupling' of two minds intently connected so that creativity can flourish (Stephens, Silbert & Hasson, 2010). We discussed how authors use 'packets' of ideas in both predictable and unpredictable ways, and how the unique blending of these ideas are the building blocks of good fiction. The gaps and blending of ideas can lead to surprise, tension, fascination and interest from the reader, and by taking on the role of cognitive

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coach, a reader can discuss the story's gaps and blends with the author so that together they improve the narrative's complexity and impact.



Figure 3, Excerpts from Lesson on Cognitive Coaching

Students were then given a narrative writing prompt from Cambridge International Examination (2015) IGCSE First Language English Paper 3: Directed Writing and Composition (Appendix D) and asked to write their own original story using our new Google Docs app available through their recently assigned Google Gmail account, starting their initial planning work in our computer lab of brand-new iMac computers, and then finishing their stories in the quiet solitude of their own homes, where their best thoughtful and inspired work could perhaps be done. This stage of the research project was indeed the most crucial, in that students were asked to use both their previous training in elements of plot, characters, setting and climax to write their stories on a conscious, intellectual level, as well as incorporate the free association of spontaneous memories, emotions and unusual ideas which can make creative writing unusual and novel.

After writing their short story, each student 'shared' their work with a peer, who carefully and closely read their narrative, and offered 'comments' via the Google Docs toolbar, following a coaching model (Stenbom, Hrastinski & Cleveland-Innes, 2012) which emphasized the importance of a "zone of proximal development" (p. 38) where student writers are pushed incrementally forward by their peers in small steps that do not overwhelm or intimidate them. The art of drafting and revision, so critical in creative writing and explored with insight by Freeman (2014), became a significant cognitive task as these student writers sought to defend and explicate their choices as writers to their peer readers who perhaps had difficulty following or appreciating the original short story. The students were guided in the type of questions they could pose as a 'cognitive coach' to a 'creative author' so that this peer-interaction remained focused on a cognitive level, and not merely on grammar or mechanics.

Supportive Questioning Techniques for Cognitive Coaches
I really liked the way you began this story. Where did you get this idea?
Good authors "show" and don't just "tell" what is happening in the story. Is this part here an example of "show, don't tell"?
I'm a bit confused by this part of the story. Can you explain it to me?
At this point in the story, I thought "X" would happen. Can you explain why "Y" happened instead?
What a great ending! I have, however, a question about…

Table 1, Guiding Questions for Cognitive Coaches

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As an exercise in our school's new computer lab, students were able to both discuss their work in-person with each other, and then follow-up with more comments and 'chat' later from their own homes after the lesson was over. The teacher could support this exchange by both helping students use the 'comment' tool effectively, and listening to the face-to-face discussions between the student pairs. By using the Google Classroom app, the teacher smoothly managed the submission of assignment, and offered her own 'comments' and feedback on the stories written by the students.

During the course of this case study, the students also participated in exercises designed to boost their creativity skills, such as an Alternative Uses Test asking them to come up with as many uses as they can for a paperclip (Appendix C), and a pre- and post-test of Remote Associates Test (RAT) which gave them three unrelated words and asked them to supply a fourth to complete the sequence (Appendix B). These exercises were chosen to develop the students' appreciation of the role of imagination in thinking creatively, and were completed as a fun activity, rather than an assessed assignment. The verbal creativity exercises proved quite interesting to some of the students, and several of them chose to do many more RAT quizzes later on their own.

PARTICIPANTS

The bounded unit used for this study was a selected sample of 13 bilingual Grade 10 students from an international school in Ankara, Turkey, aged 15-16, who were preparing for Cambridge's IGCSE First Language English (2015) qualification. The research was conducted during the second semester of the 2014-2015 academic year. These 13 students, selected from the class of 46 students (28 per cent of the population), represented a cross-section of the group, and included 6 boys and 7 girls; 9 Turkish national students, 2 international students and 2 Turks who had lived extensively abroad. They were chosen so that the research project could capture most of the experiences and perceptions of the entire class, all of whom participated in the lessons and activities presented by the researcher.

As part of their curriculum, these students were also studying Cambridge's IGCSE English Literature (2015) and had read works by Ray Bradbury, Jane Austen, William Shakespeare, J.D. Salinger, Oscar Wilde, Robert Louis Stevenson, Thomas Hardy, William Golding and other authors over the course of the two-year program. In fact, many of the discussions and activities

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of literary analysis performed by the class had explicitly addressed the role of creative imagination in fictive works-- for example, Jane Austen's parody of Gothic literature in *Northanger Abbey*, Shakespeare's development of imagination with Prospero in *The Tempest*, and Stevenson's treatment of deranged imagination in *The Strange Case of Dr. Jekyll and Mr. Hyde*. The research question on the role of cognitive coaching in creative writing therefore connected well with the previous work done by the students within their English coursework.

These students had been taught by the same teacher for two years, which was an important factor in developing an atmosphere of trust, respect, and familiarity in this research project. The students had been exposed to a range of verbal creativity activities during the course, such as poetry and descriptive writing lessons, a full year of daily puns, and an annual Shakespeare Film Festival where they were asked to collaborate in small groups to create a film trailer or scene from *Romeo & Juliet* in Grade 9 and *The Tempest* in Grade 10. They had also repeatedly participated in the annual International School's Assessment (ISA), a standardized test which assessed their creative narrative writing against peers from similar international schools.

Some of these students (58 per cent) professed a desire to write creatively-- as evidenced by their enthusiastic participation in various optional extension activities organized by the teacher. Examples include winning recognition in international writing competitions, publishing their essays and poetry in *Skipping Stones Multicultural Literary Magazine*, and presenting original academic papers as Grade 9 and 10 students at our local university's annual Anglo-American Literature Conference. Other students in this study (17 per cent) admitted that they do not like to write very much and in fact preferred not to read for fun either-- perhaps not surprising in a randomly selected group of adolescent learners.

All of the students knew each other quite well, and many had been together at the same school for many years. Details about their background (years at the school, number of siblings and birth order, left or right handedness, views on creativity, participation in the arts, parental background) were collected at the beginning of the study (Appendix G) to determine factors leading to the research question posed by this case study-- the impact of cognitive coaching on creative writing by high school students. Interestingly, there was some correlation between students who indicated that they felt their parents were creative, and in the enthusiasm with which they themselves approached the task of creative writing (Tan & Grigorenko, 2013).

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The language background of these students consisted of 66 per cent mother tongue Turkish and 17 per cent mother tongue English. Each student also had followed a second foreign language curriculum in French, German or Spanish from Grade 6. Two of the international students had additional mother tongue background in Dutch and Persian languages.

DATA ANALYSIS

Data for this research project was collected at five stages: introductory background questionnaire, Remote Associates Tests and Alternative Uses Thinking Test, teacher observations and transcripts of coaching session, evidence of student comments on stories— and lastly, triangulated by exit interviews and small-group informal discussions (Appendix E). A mixed-method approach to data analysis was chosen for this project since the study revealed both qualitative and quantitative results. Specifically, patterns of similar responses were collected and coded until so that predominant themes could be noted and explored.

In analyzing the quantitative data of this study, the results revealed high flexibility of thinking with an average score of 8.53 in the Alternative Uses Test asking students to imagine as many uses as they could for a paperclip. The Remote Associates Test, which assessed verbal creativity in finding one word that relates to the previous three in a series, actually dropped during the study, averaging from 6.0/10 at the beginning of the study to 5.5/10 in a post-test.

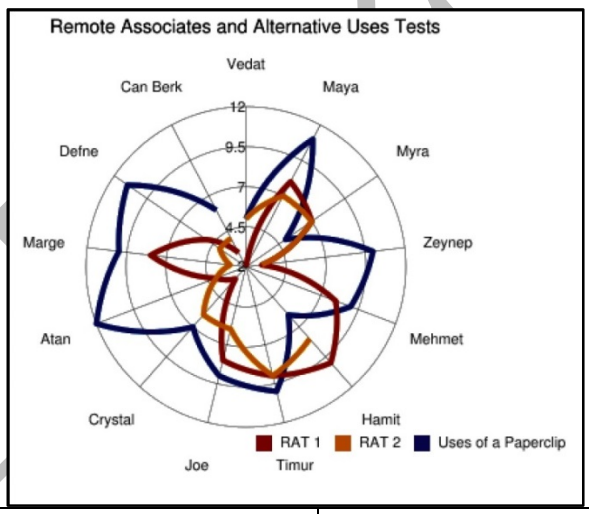
Teacher observation, note-taking, and interviews with the students in this case-study revealed an improvement in the *enjoyment* of creative writing among those students who really put their best effort into the project. These students seemed to enjoy using the computer's collaborative functions to improve their writing, perhaps because this was the first time we had used the computer in our writing lessons.

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Student	Was cognitive coaching helpful in improving the *quality* of your creative writing?	Did this approach increase your *enjoyment* of creative writing?
Zeynep	Yes! Because we get to discuss our opinions on characters, their personalities and thinking process.	Sure! It underlined the importance and hidden 'fun' behind writing a story. Working in a computer lab, seeing how our friends also work on the same text, increased our courage and passion. We were able to put all of our mind and heart to our writing.
Hamit	It helps you view your writing from different points of view. It also made my work better by helping me use better vocabulary. Moving from our regular classroom to the computer lab helped me to analyze my writing in a fresh way. I also liked the fact that I could share my writing with my peer so he could analyze it on a different computer.	I did enjoy sitting down with my friends and analyzing my work. It was fun because we used technology; something we had never done before. The chat bar made the process enjoyable.

Figure 4 Remote Associates and Alternative Uses Tests

Defne	Yes, because we usually add unnecessary details or make unexplained decisions while we are writing a story, making it less effective. When we direct questions and make comments about this (to the author), the author feels the need to support his/her claims, therefore the quality of the writing increases.	It will increase the enjoyment of students in doing creative writing because you enjoy doing things that you are better at and cognitive coaching increases the quality of your creative writing.



Maya	Cognitive coaching can definitely increase the quality of writing because it provides a perspective other than one's own. The student has a chance to improve his portrayal of his characters' thinking process to give a deeper understanding of the story. This coaching also spurs creativity, combining creative input of two people.	The computer application Google Docs was helpful because we could edit documents simultaneously, easily and quickly. The warm friendly atmosphere encouraged us to work, share a new experience, and bond with your friend.

Table 2, Sample Student Reflections on Cognitive Coaching

There was also evidence that the students benefitted from peer-collaboration on the *process* of writing (Yang, 2011), as they expressed that indeed they had learned from each other as they

each read and discussed their stories. As Yang had seen with college students, a peer-review system can also be effective with high school students as they mutually discuss problems and concerns in developing their stories. This method of cognitive coaching (Archon, 2008) in the field of creative writing was seen as truly helpful by many of the students in the case study.

Evidence of the effect of cognitive coaching on student creative writing can be found in these transcripts of conversations between coach and writer:

Ela (coach) to Atan (author): More dialog would be better to show the interaction between the characters.

Atan: I don't like to use dialog. I think dialog breaks the flow, the emotion…

Ela: But in narratives, it is quite important. Even one back-and-forth.

Atan: Maybe only one statement. More dialog would ruin the flow.

Ela: Okay. I'm the cognitive coach, so I give back to the author my advice but the final choice is still the author's.

Defne (coach): Good story! I have a couple of questions. Why Peru?

Can Berk (author): (I chose it because) it was a country that was different.

Defne: (questioning the character); Does his motive change in later developments?

Can Berk: That was intentional, I wanted the reader to know information about the main character, foreshadowing, even from the title. Your perspective is helpful to me as writer, since some parts (of the story) I understand but you as the coach don't.

Marge (coach): Some parts were confusing-- you could explain different parts (more clearly). Like the part about the song, "Reminds her…"

Elif: (author): My intention with a song was that maybe the reader could figure it out. But I could have explained it more.

Marge: I think the music was successful, in the band room, with the link to the song. But I didn't know the song until you told me.

Elif: Maybe the reader could look it up, to feel the atmosphere.

Marge: Or maybe use another song, that's more well-known, but that might ruin the atmosphere...

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The experiences of the students in reflecting on the research project revealed an overall positive impact. As an example, one student stated,

"It's great to look at different stories and see her great ideas. I'm getting some ideas for future stories and also in order to correct my mistakes it was helpful (to collaborate) and we both took a lot from this opportunity. It's just great to see you with your friends. This was really helpful--we had fun. It's great to read your friend's story and get ideas you would not have thought of in the first place. My friend used really interesting ideas in her story; she used her imagination very effectively. I got good ideas from her." Zeynep

Another student reflected on the benefit she received from cognitive coaching:

"Having someone read something that you have written is very helpful, because when you're writing it you already know what you're trying to say, so you don't realize if you haven't explained it properly. Someone looking at your story objectively rather that subjectively will be able to point out any weaknesses in your explanations that you may not have noticed." Maya

These responses illustrate the importance of writers getting into the minds of their readers, to anticipate comprehension difficulties and improve the coherence of their stories. As Hasson, Ghazanfar, Galantucci, Garrod & Keysers (2012) described in their research, brain-to-brain coupling between author and reader can be a powerful result of collaborative creative writing.

Other students commented that the 'research' tool embedded in Google Docs was helpful in finding the right words or precise details for setting to make their story more realistic, a particularly helpful aid for bilingual writers. This important research tool opens the writer's world to 'Googling' any questionable detail and has revolutionized the ease with which writers can now add convincing factual context to their stories.

However, not all students were uniformly positive in their assessment of the impact of cognitive coaching on their own creative writing. Negative feedback included a student (Joe) asserting that there really wasn't anything new in using cognitive coaching to help develop creative writing skills, since in many ways this was the same as 'peer-editing' exercises that he had done repeatedly in middle school and other language courses. Another student (Myra) pointed out that true 'neuro-coupling' can only happen with deeply bonded individuals such as twins who have shared a lifetime of intimate experiences. One student (Marge) felt the computer

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lab became too noisy with so many students talking and sharing ideas, so that it was hard to think intensely about her story. Another student (Defne) prefers to use paper and pen instead of computer programs to write because for her, handwriting matters. Lastly, one student (Crystal) wondered if the novelty would wear off after the students spent more time using the computer in English class.

Nevertheless, most of the students felt there was great value in the collaborative nature of peer-coaching on their short stories (Hooker, 2013), but further research should be done to specify how such collaboration in creative writing can best be optimized in school settings at the lower-secondary level. For example, do certain students (personality, IQ, English language ability, interest in STEM) respond to cognitive coaching more than others? Does the length of time working together as coach/writer affect the benefits of cognitive coaching? What is the precise role of paired-talk, gestures, body language and physical proximity in cognitive coaching? What is the best way to train student cognitive coaches? These and other questions can be addressed in further studies as educators investigate what kind of environment best nurtures creativity among adolescent writers.

DISCUSSION AND CONCLUSION

The findings of the study, in which students reported an increased appreciation of the cognitive processes involved in creative writing and a marked increase in the enjoyment of writing short stories, leads to a conclusion that such an emphasis on the fascinating workings of the creative mind within an environment of intense collaboration can truly benefit student writers and form a critical part of lower-secondary English language instruction. Educators who use cognitive coaching to encourage the intellectual freedom of their students, as students turn over new ideas, explore various perspectives, and engage in rich debate and exchange over their creative stories, may well notice higher degrees of creativity emerging in their students.

In this study, students expressed three important advantages that they received from this exercise in cognitive coaching. Mostly importantly, nearly all of the students (85 per cent) felt that it was genuinely helpful to gain a different perspective on their work, with two minds working together to share insights, deepen themes, and increase the creativity of their work. Many of the students explicitly mentioned that this approach made them think more imaginatively and improved the quality of their stories, particularly regarding the clarity and

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flow of their ideas as they discussed the reader's point of view. These students truly enjoyed the exercise and stated that such cognitive coaching might also help them in math, social studies, and science. The second advantage to cognitive coaching came from the enjoyment both the author and reader derived from working closely with a supportive peer in a warm atmosphere. Thirdly, most of the students felt the use of computer applications was beneficial to their writing, which made changes and edits easier, and helped them share their ideas swiftly with each other.

The study also pointed to limitations of cognitive coaching when applied to creative writing, including the counter-argument by some of the students (15 per cent) that good writing is often intensely personal and cannot easily be shared with a peer. These students felt that it can be difficult to lose yourself in your imagination when working with someone else—they found cognitive coaching restricting, especially when the coach and author did not agree on choices made by the author. There were also some disadvantages in using the computer lab for this work, including distracting conversational noise and some preference for using pen/paper in writing stories, as well as a learning curve for teacher and students in utilizing unfamiliar computer functions effectively.

In conclusion, this study revealed that cognitive coaching can be a helpful tool in developing 21st century creativity skills in student writers, and holds genuine promise for educators who wish to strengthen cognitive achievements of their students, both as creative story-tellers who build imaginary worlds, and as attentive listeners who strive to deeply comprehend a fictive narrative. The innovative teaching techniques offered by cognitive coaching can be an important and effective part of the teaching and learning process in English language courses.

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Foreign Students' Competence Development In The Field Of Marketing Research

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Abstract
In an effort to get into the top 100 world rankings tpu faced with the necessity of active involvement of foreign students, as well as ensuring a high level of education. However, to determine the degree of satisfaction of tpu alumni – foreign citizens – is not a simple task. Geographical distance, language barriers, excessive formalization of relations with the alumni, limited human resources complicate obtainment of an objective information for tpu representatives.
This problem was solved by the suggested involvement of international students in the process of marketing research using online survey form of google docs [1]. This initiative was proposed in the framework of the course marketing for the development of students research skills.

PREAMBLE

The objective of National Research Tomsk Polytechnic University is to enter the Top 100 universities in the world, and one of the key criteria for assessing the achievement of this goal is the number of foreign students (rating methodology QS [2]).

TPU has been successfully developing attraction of foreign students (18% as of 2014). However, further development in this field impels understanding of the satisfaction degree of foreign graduates who received higher education at TPU. After graduation, foreign graduates go to different countries and further tracking of their professional development is problematic.

The goal was to involve currently studying foreign students into the process of marketing research within the course Marketing that will enforce achievement of the following objectives:

1) Development of foreign students (research subjects) competences in the field of market research and familiarization with electronic resources for remote interrogation;

2) Actualization of a foreign graduates (objects of study) database;

3) Determining the level of satisfaction of foreign graduates with the education received TPU;

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4) Development of a mechanism for formation of stable relations and contacts with former foreign graduates.

A prerequisite of the survey was the belief that the quality of education at a university can be assessed, inter alia, by analyzing the satisfaction of graduates, as well as basing on the fact of employment according to their specialty.

At baseline, the authors put forward a hypothesis: the quality of education of TPU foreign graduates is high and meets the requirements of the labor market.

The object of the study are foreign experts and young scientists who graduated TPU. The subject of study is the quality of their training and their career direction.

The method by which the study was conducted is online survey of foreign TPU graduates.

DESCRIPTION OF RESPONDENTS

At TPU there are about three thousand of foreign students from 48 countries of Europe, America, Africa and Asia, including the CIS countries studying at different programs (in English, "2 + 2", program of an academic exchange, PLUS Scholarship, etc.).

Each year, TPU issues diplomas to about 100 foreigners from different countries. In 2013, 128 graduates received TPU diplomas, including 38 specialists-translators from Russia and Kazakhstan, 90 foreign students from 9 countries [3]: Vietnam, China, Mongolia, Brazil, Nigeria, India, Ecuador, Indonesia and Zimbabwe.

In 2014, there are 247 students from China, about 200 students from Vietnam [4], more than 100 Mongolian students. These students represent the general population for the study.

The selection comprised of 25 graduates from China, Vietnam, and Mongolia who studied full-time and mastered the curriculum together with Russian students.

The applied method of assessing was based on an online survey using form of Google Docs. This method has been chosen due to geographic remoteness of respondents: they all went to their homeland and were thousands miles away from the interviewer.

In addition, the choice was dictated by the social portrait of a graduate: a young and smart person, confidently using computer technology. Thus, the questionnaire distributed via e-mail and social networks, would be relevant to them.

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The questionnaire contained 12 questions. The pattern of the questionnaire is shown below in figure 1.

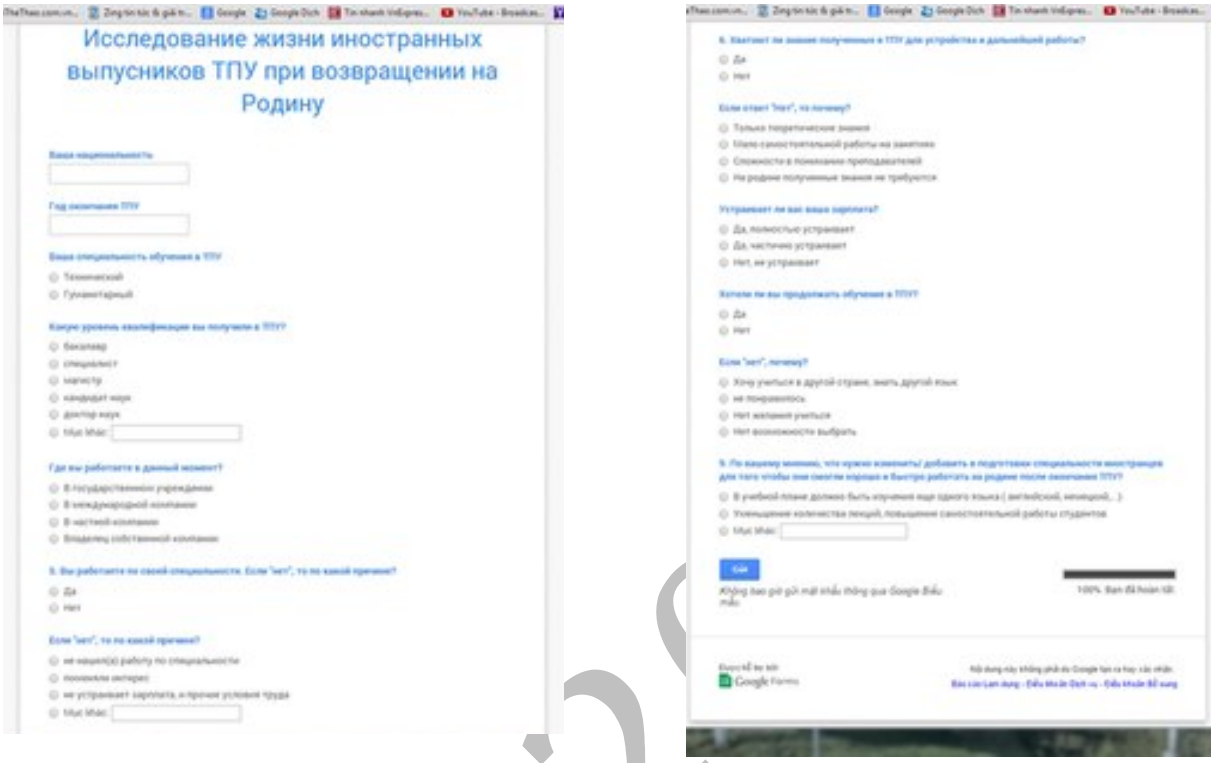


Figure 1 - The pattern of the questionnaire

RESEARCH RESULTS

Questionnaire data were grouped into a common questionnaire base with the help of Google Docs instrument and then analyzed (fig. 2).

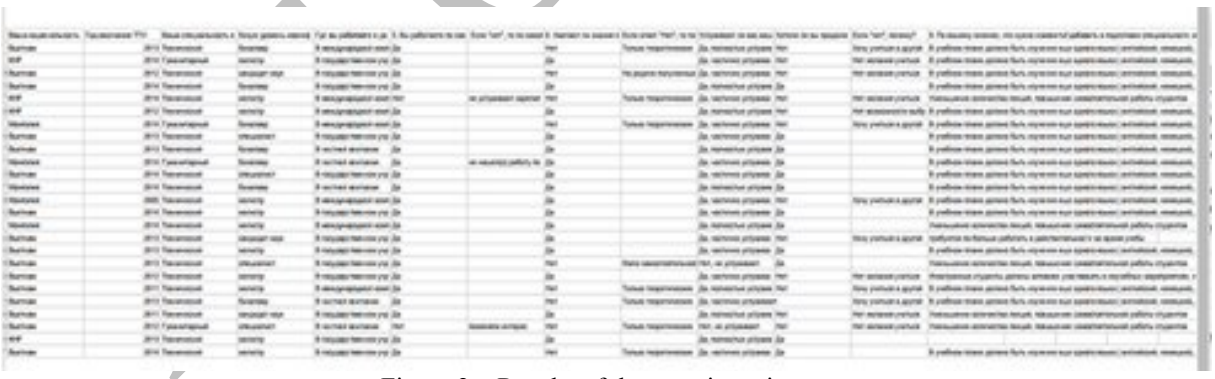


Figure 2 – Results of the questionnaire

Among 25 respondents participating in the survey, the first place is occupied by Vietnamese students (16 people, 64%), the second - students from Mongolia (5 persons, 20%), the lowest share belongs to students from China (4 persons, 16%). Most respondents completed TPU in 2014 and in 2013 (40% and 32% respectively), while the lowest - in 2005 (4%).

The majority of respondents received technical education (84%), arts and humanities – the remaining 16%. This is due to technical specialization of TPU.

Most of the foreign graduates after undergraduate studies entered Master courses at TPU or other higher education institutions to enhance their expertise. Many international students want to have a university degree not lower than Master's. This proves Figure 3, which shows that the majority of foreign graduates have a Master's degree (44%), then Bachelor's degree 28%, other 16% are Specialists and 12% - Candidates (PhD).

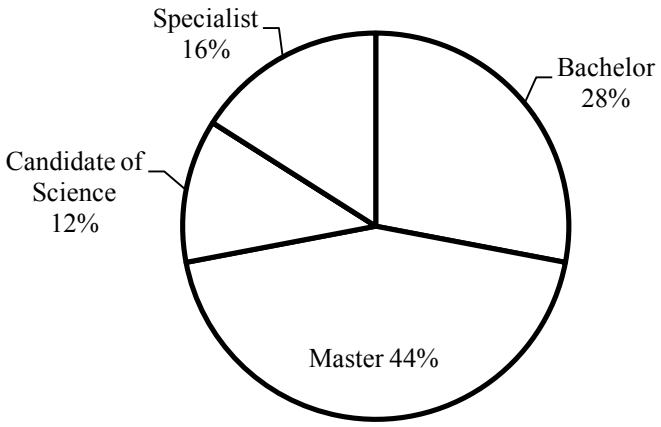


Figure 3 - The level of education of foreign graduates

These studies showed that 100% of foreign graduates we were able to find a job. About half of the respondents work in public institutions (52%), one-third – in international companies (28%), in private sector – 20%. The data can be explained by the following fact. Since the majority of respondents are graduates from Vietnam, this distribution reflects the features it is their training. Employment in government sector prevails. Firstly, because many Vietnamese coming to study at TPU received a scholarship from their State. Therefore, after graduation they must return to Vietnam and work in government offices. Secondly, in Vietnam work in public institutions is very prestigious. Thirdly, the majority of students receive technical training, and returning to Vietnam work in technical fields, many of which belong to the State. Employees are given a high salary. These companies include, for example, Vietsovpetro - Russian-Vietnamese oil company, the general oil and gas company Petrovietnam.

On the question of whether the respondents are working according to the specialty, 92% answered in the affirmative, negative – 8%. This distribution suggests that the majority of graduates unable to find application of knowledge, therefore, the level of training of foreign experts and scholars at TPU meets employers requirements from Mongolia, China and Vietnam. The correspondence of graduates knowledge to employer preferences indicates a sufficient quality of education received by foreign students at TPU. Among the two

unemployed graduates with a degree, one person was not satisfied with the level of salary, and the other wanted to work for a different field.

The majority of respondents believe the resulting TPU level of knowledge is sufficient for employment (16 people, 64%) and the remaining (36%) do not think so. This fact makes it necessary to identify the reasons of such dissatisfaction.

When answering the next question, it was found that among nine people dissatisfied with the level of acquired knowledge, seven people feel that they lack practical knowledge, and one indicated that in their country this knowledge is not in demand; Another said that independent work was not enough (Fig. 4).

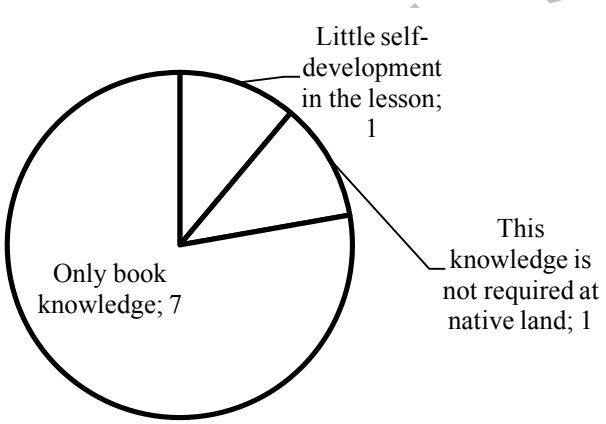


Figure 4 - Reasons for dissatisfaction with the level of received knowledge

Such requests, as increasing the number of lessons aimed at the acquisition of practical experience in the field of future work, as well as paying attention to theoretical basis, taking into account the peculiarities of student's home countries, should be considered to improve the level of training of foreign students at TPU.

The respondents answered the question about salary satisfaction level as follows: more than a half of the respondents (56%) are satisfied with the level of current salary, more than a third (36%) partially satisfied, only 8% are not satisfied. Naturally, the salary of a beginning worker cannot match their ambitions, and it should be noted that it may not be very high due to the lack of experience of graduates as employees.

Overall, 52% of respondents are willing to continue their education at TPU, and 48% - no. The reason this reluctance, is shown in the Figure 5: 50% do not want to continue their education, other 42% want to study in another country and get an opportunity to learn another foreign language. Besides, 8% are in such a situation that they have no choice of the place of training, so they cannot continue to study at TPU.

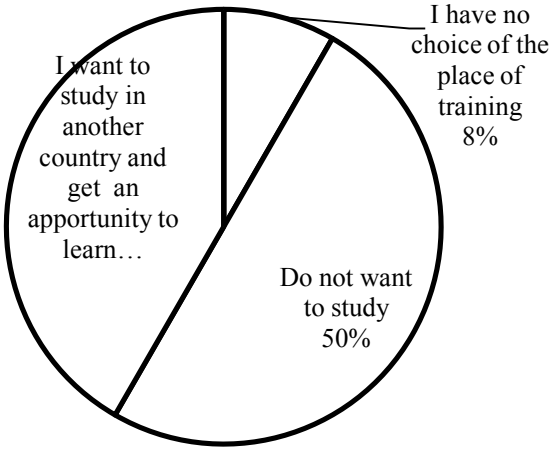


Figure 5 - The reasons for the reluctance to continue education at TPU

One of the final questions of the questionnaire provided to foreign graduates suggested that they make proposals for improvement of the level of training of foreign students at TPU.

The majority of graduates (72%) said that in addition to the Russian language at least one foreign language should be introduced to choose from. In the context of the integration process, this requirement, according to the authors, is appropriate. Also, 20% wanted to reduce the number of lectures and increase the number of self-study, what indicates that foreign graduates participating in the survey favor the European way of learning. For 8% of respondents it was difficult to propose specific options.

CONCLUSIONS OF THE STUDY

According to the study, the level of training of foreign experts and scholars at TPU are characterized by above average. Students who have been trained at TPU, are in demand among employers in homeland, they are highly competitive. After graduation they found a job related to their specialty, the majority of graduates is satisfied with their salary. Many of the graduates are employed in public institutions. This proves that the knowledge gained abroad benefit native country.

However, the survey revealed a number of problematic areas in higher education at TPU. To solve them, a number of recommendations to managers of educational programs at TPU could be suggested:

1) To increase the number of sessions aimed at the acquisition of practical experience in the area of future work of foreign students;

2) To review the theoretical basis of educational programs allowing for the future work of the students in their home country;

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3) To introduce another foreign language to choose from;

4) To reduce the number of lectures and increase the number of independent work. It is accepted in many developed countries: students are involved in interactive activities in classrooms, and devote more time to work independently.

CONCLUSION

This paper presents the results of the marketing research completed by TPU students of foreign nationalities. In order to develop research skills, the students made the online survey using form of Google Docs and were able to assess the level of satisfaction of TPU foreign graduates with their education.

According to the results, the hypothesis launched at the beginning of the study stating that the quality of education of foreign graduates at TPU is high and meets the requirements of the labor market was partially confirmed. Almost all foreign TPU graduates work according to their specialty and can perform employers' tasks basing on the knowledge obtained at TPU.

As a result of analysis of identified problems and recommendations from respondents, the authors were able to offer a number of activities aimed at improving TPU educational programs for foreign students. As for the authors, by having this research done, they formed their own professional competence in the field of marketing research and brought practical benefits to the university.

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How Can We Integrate Technology Into Measurement And Evaluation? Implementation Of An Exam Management Application[3]

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Abstract
Considerable amount of resources have been being invested in order to use technology in education effectively. Also there are many research findings which have showed the benefits of technology integration in terms of learning and teaching. On the other hand technology can be integrated into measurement and evaluation processes, which are indispensable items of education. However there is little research on this topic. In this research, an exam management application was developed and used in order to manage and conduct a common exam, from preparation to evaluation, covering 552 students from 4 different undergraduate programs in one session. The aim of this research was to present the exam management application developed and identify the effects of this implementation on student satisfaction, lecturers' views, time spent and workload. Results showed that this implementation succeeded in positive results in terms of the variables mentioned above. Results and the application also would serve as an example for universities about how to design, develop and integrate applications for measurement and evaluation in educational settings.

INTRODUCTION

There are many research findings on integration of technology in education (Ertmer, Ottenbreit-Leftwich & Tondeur, 2014; Nickerson & Zodhiates, 2013; Oh & Reeves, 2014; Watson & Tinsley, 2013). Integration of technology in education is a current issue. Davies & West (2014) defines technology integration in education as "*The effective implementation of educational technologies to accomplish intended learning outcomes*". According to technology integration in education guidelines of Jhurree (2005), developing countries should establish a list of priorities based on their needs, specificities and capabilities, and then apply appropriate guidelines to execute and evaluate their plans.

If universities are to remain competitive in the new millennium, they must effectively integrate technology (Rogers, 2000). Especially the subject of technology integration in higher education should be taken into consideration. In the increasingly competitive arena of education, today's universities have to update themselves in the light of current technological developments. In order to provide high quality of higher education for undergraduate

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students, universities should benefit from a variety of technology based implementations in almost all university activities like courses, campus life, student affairs, measurement and evaluation etc.. It is obvious that there is little research about integration of technology especially into measurement and evaluation in education. However technology can be integrated into measurement and evaluation processes, which are indispensable items of education, in order to provide exam quality, standardization, student satisfaction and decrease time and labor spent.

Development of internet technologies has brought a different dimension for education. There is an increase in the number of schools and institutions providing education on the internet in recent years. As a result, measurement and evaluation processes can be conducted using internet (Callı, 2003). Assessment is an important aspect of differentiated instruction that can be strengthened by technology. The most important factor to be considered about testing in schools has been accountability and technology has the potential to be extremely valuable (Davies & West, 2014). "Technology today offers many new opportunities for innovation in educational assessment through rich new assessment tasks and potentially powerful scoring, reporting and real-time feedback mechanisms." (Scalise & Gifford, 2006)

Some universities in Turkey (e.g. Gazi University and Ankara University) use different kinds of software in order to manage examination processes, especially when number of students taking the examination is high. These universities make use of such exam management applications (software) in order to manage common exams effectively, fairly and correctly.

In this research, an exam management application was developed and used in order to manage and conduct a common Basic English exam, from preparation to evaluation, covering 552 students from 4 different undergraduate programs in one session. The aim of this research was to present the exam management application developed and identify the effects of this implementation on

- Student satisfaction
- Lecturers' views
- Time spent
- Workload

This implementation experience also resulted in some recommendations about how to

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integrate technology into measurement and evaluation in educational settings.

THE STUDY

Descriptive survey method was used in this study (Fraenkel, Wallen & Hyun, 2012). An exam management application was developed. This system was used in order to conduct Basic English exam on 552 students. Students were from Ahi Evran University Faculty of Economic and Administrative Sciences. Data were gathered using the academic achievement test (Basic English exam), student questionnaire and lecturer interviews.

The student questionnaire was applied to all participants just after the common examination, before the announcement of the exam scores. Only the first question was asked before the implementation (common exam). Totally 494 students answered the questions voluntarily. This questionnaire included the following questions:

1. Generally what is the most important problem for you about the exams of common courses you take like Basic English?
2. Basic English exam was conducted as a common exam in one session for all departments in your Faculty. Optical forms were used and exam questions were the same for all students. Which of the following is the most important benefit of this implementation for you?
3. Are you satisfied with this new common exam implementation?
4. Should this implementation be generalized for all common courses in your university?

An interview was designed and conducted with 3 lecturers giving Basic English Course in Faculty of Economic and Administrative Sciences. They were asked open-ended questions about the implementation in order to gather data regarding their expectations, opinions and recommendations.

The architecture of the exam management application, developed and used for this research, is given in Figure 1. The application was designed after needs analysis phase. This server-side web based application was designed in order to provide faculties for ease of use. Coding was done with PHP, which is a widely-used open source scripting language. SQL SERVER 2012 Express was used for the database of the system. The integration of the system with the Student Affairs Information System was ensured by XML web services.

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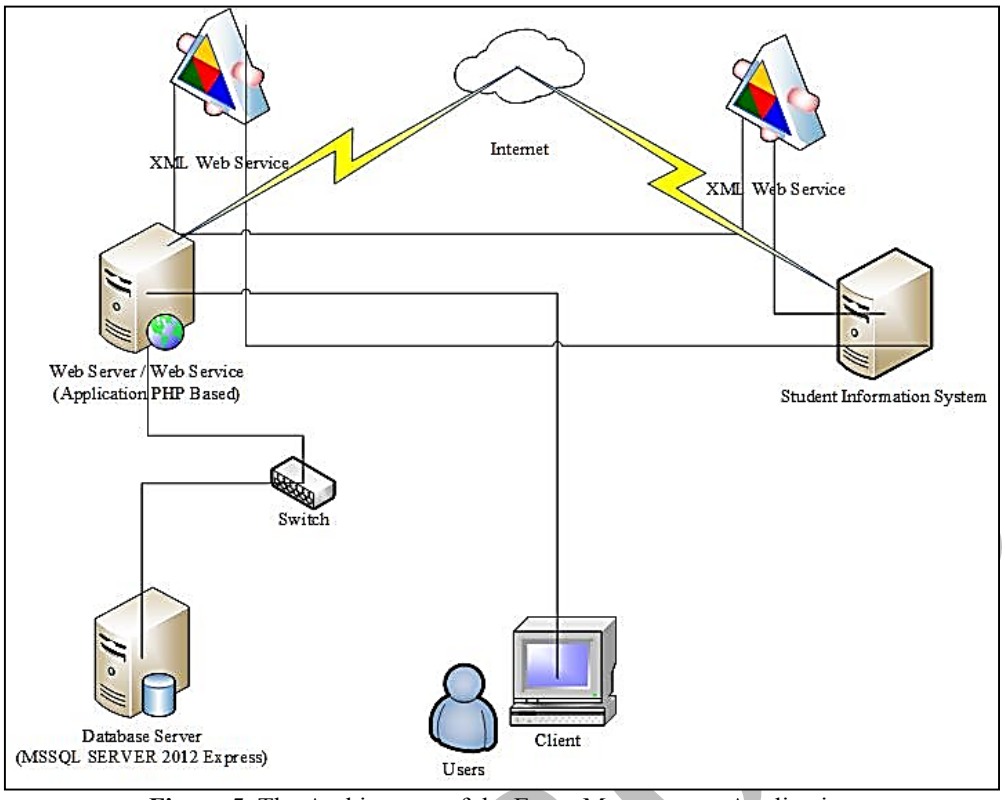


Figure 5. The Architecture of the Exam Management Application

The application has 6 modules. Modules of the application were given in Figure 2.

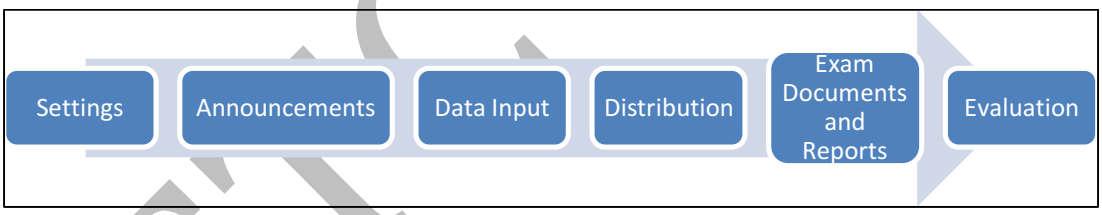


Figure 6. Modules of the Exam Management Application

1. Settings Module: This module is for user definitions, authorizations and session security.

2. Announcements Module: Users and managers can interact using this module. All the necessary announcements and notifications can be shared.

3. Data Input Module: All the data required to conduct the exam is entered to the system using this module; Exam session dates, data related to classrooms and buildings to be used for the exam, observers' information etc.

4. Distribution Module: Students and observers are distributed virtually to exam classrooms according to preferences.

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5. Exam Documents and Reports Module: This module includes printing optical forms for each student with their information on it and preparing all the required forms and reports specific for each classroom to be used during the exam.

6. Evaluation Module: This module includes entrance of answer keys, creating data file from optical forms, producing exam scores and reporting them in the required format. In addition, some statistical outputs like average score, item difficulty and item distinctiveness can be made in this module.

FINDINGS

Findings related to first question in the student questionnaire were as follows:

22% of the students (with average exam score= 48,9) stated that the most important problem about the exams of common courses is *assessment and evaluation quality*, 19% (with average exam score= 53,6) stated *exam quality*, 18% (with average exam score= 51,9) stated *quality in evaluation*, 16% (with average exam score= 53,7) stated *validity and reliability of exams,* 15% (with average exam score= 52,8) stated *late announcement of exam results,* and 10% (with average exam score= 52,1) stated other problems.

Findings related to second question in the student questionnaire were as follows:

36% of the students (with average exam score= 53,3) stated that the most important benefit of this implementation is *announcement of the results immediately*, 17% (with average exam score= 50,7) stated *evaluation style*, 16% (with average exam score= 47) stated *validity and reliability of the exam*, 13% (with average exam score= 52,4) stated *implementation style of the exam,* 10% (with average exam score= 58,5) stated *quality of the exam,* and 8% (with average exam score= 50,5) stated other benefits.

Findings related to third question in the student questionnaire were as follows:

22% of the students (with average exam score= 59,8) were *very satisfied* with this new common exam implementation, 40% of the students (with average exam score=56) were *satisfied*, 8% of the students (with average exam score=51,4) were *undecided,* 11% of the students (with average exam score=49,8) were *not satisfied, and* 19% of the students (with average exam score=43,4) were *too unsatisfied.*

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Findings related to fourth question in the student questionnaire were as follows:

42% of the students (with average exam score= 58,6) think that this implementation *should definitely be generalized* for all common courses in their university, 31% of the students (with average exam score= 54) think that this implementation *should be generalized* for all common courses in their university, and 27% (with average exam score= 46,8) think that this implementation *should not be generalized* for all common courses in their university.

Lecturer interview data showed that lecturers were very satisfied with this implementation. They especially emphasized that this new implementation could brought standards for exams and that it saved time and definitely decreased workload. They also mentioned equality and safety could be ensured by this implementation.

Compared with existing examinations, the implementation decreased the time spent for preparation to announcement of the results. Exam results were announced on the web 2 hours after the exam finished. Department, group or lecturer basis achievement graphics were presented for the faculty.

CONCLUSIONS

It can be concluded that the exam management application was successful in terms of student satisfaction, lecturers' views, time spent and workload. Findings showed that students (especially those with better exam scores) were satisfied with this implementation. Lecturers' opinions towards the implementation were positive.

It is obvious that students and lecturers want standardization in evaluation processes. This kind of implementations should be taken into consideration by universities because they will be beneficial for standardization, interaction between lecturers, quality of exams, providing evaluation reports for lecturers and managers and saving time.

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Hypermedia Reading Strategies Of TESL Undergraduate Students In Malaysia

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Abstract

This study investigated hypermedia reading strategies employed by ESL students and how they overcame the difficulties faced while reading the hypermedia materials. The hypermedia materials were Teaching English as Second Language (TESL) related materials. This case study involved ESL undergraduate students from a higher institution in Malaysia. They were asked to read authentic hypermedia reading materials using Think Aloud Protocol (TAP). The other research tools are semi-structured interviews, reflective notes and observations. The findings revealed that the participants employed Global Reading strategies more than Support and Problem-solving strategies. One of the main difficulties that they encountered was inability to comprehend the jargons and terminologies. Online dictionaries and Google Translator were used to obtain the definition of the unfamiliar words. In addition, making inferences was also another solution employed by most participants.

Keywords: Hypermedia reading strategies, TESL undergraduate students, Think Aloud Protocol, academic genre

INTRODUCTION

Pearson (1985) defines reading as an activity of making sense of a sentence. As second language students, reading is a very crucial skill to know **(**Grabe & Stoller, 2001**)**. Having the capability to read in any language especially for second language students could help them to understand the specific reading materials by relating new knowledge with previous ones (Ketabi et al., 2012). Eskey (2005) states that as they depend mostly on the literacy input, students of a second language need to master the reading skills first instead of the speaking skills. Thus, to ensure full comprehension while reading in a second language, these students need to master the reading skills including the different types of strategies in reading in a second language. Therefore, educators need to educate and equip their students with relevant reading strategies to enable them to become better readers (Wallace, 2010).

According to Ketabi et al. (2012), in the late 1970's and early 1980's, researchers began to pay more attention to reading strategies in the area of second language reading research. Many studies that have been done on printed material reading strategies used by EFL/ESL students reveal that in order to increase students' reading comprehension, it is important to know the correct use of reading strategies (Anderson, 1991). However, due to advances in

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technology, Internet has become one of the most important contexts for education; and has been broadly used in many parts of life (Anuar & Jeffrey, 2012; (Park et al., 2014). Apparently, students are now increasingly accessing reading materials through the Internet. However, to read hypermedia materials, different strategies must be acquired by the learners in order for them to fully understand the materials (Maslawati, 2012).

Consequently, according to Shapiro and Niederhauser (2004), since the 1980's, many researchers have started to focus on reading and learning through online texts. The need to conduct such studies is heightened given the increase in the usage of computer-based facilities and educational resources especially in second language teaching and learning. According to Sepideh et al. (2013), majority of language teachers have considered using computers in the process of language learning. These advances have changed the concept of reading where reading is not solely reliant on printed materials but also understanding and using technologies for reading (Kellner, 2001). This has become almost necessary. In many instances readers may apply their printed-based reading strategies to hypermedia reading. However hypermedia reading demands the use of additional strategies as research has shown that readers encounter new features of this new learning environment (Ketabi et al., 2012).

Thus far, there have been studies that investigated L1 students' hypertext and hypermedia learning environments but to the knowledge of the present researchers, very few have been on local L2 students. Hence, there is a need to study L2 students reading within the online environment particularly in local context (Park & Kim, 2011). Secondly, there are very few studies that have been conducted on hypermedia reading strategies, the difficulties faced and strategies L2 students took to overcome their reading difficulties in the Malaysian context. Due to these reasons, an exploratory study was embarked to identify the difficulties L2 students, in particular TESL undergraduates, faced when reading hypermedia texts and the strategies they took to better comprehend the TESL related hypermedia materials.

LITERATURE REVIEW

Electronic Literacies, Hypertext and Hypermedia

As technology starts to take on an important part in the teaching and learning process, students have been introduced to a new concept called electronic literacies. Park and Kim (2011, p. 2157) state that, "electronic literacy includes using computers, interaction through computer-mediated communication (CMC), understanding multimedia information as well as

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locating and evaluating online resources". However, reading any online and electronic materials is different from reading on paper. This type of reading offers numerous forms of materials such as video, audio, pictures and electronic texts. Thus, students need to be alert of the changes and they need to be able to choose suitable materials based on their needs and learn how to get the information (Anstey & Bull, 2006). Aside from that, reading electronic materials requires the students to access new technological tools and resources (Park & Kim, 2011). In order for the students to understand how to use and get as much information as possible from the online reading materials, it is vital for them to know more about the two important components in electronic literacies; hypertext and hypermedia.

Farkas (2004) defines hypertext as a text with hyperlinks or links. Park and Kim (2011) agreed with this idea as they mentioned that the term 'hyper' shows that there are additional components which bring to the meaning of 'hypertext' as text with links. These links in the hypertext take the students to another section of the text, another page in the website or maybe to other documents or websites (Warschauer, 1999). Meanwhile, hypermedia is an extension of hypertext that involves the presentation of video, audio, animation or all of them in a material that provide a non-linear medium type of information to the readers (Ketabi et al., 2012). Moore et al. (2004) refers that hypermedia, a more developed concept of hypertext, uses multimedia format to present the information. Multimedia simply means a combination of a few media devices such as pictures, animation, sound or motion video (Moore et al., 2004).

Definition of Reading Strategies

In general, a strategy means an action selected on purpose in order to achieve particular goals (Paris et al., 1991). According to Rubin (1975), reading strategies are defined as tools or techniques taken by readers to comprehend the reading materials. Ketabi et al. (2012) state that reading strategies are approaches employed to solve the problems faced during the meaning-making processes.

Hypermedia Reading Strategies

Reading is believed to be one of the important skills to gain success either in education or in the profession (Rastakhiz & Safari, 2014). Rubin (1975) mentions that by equipping students with proper reading strategies helps them to be more effective readers. The study

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reported in this paper employed the framework of reading strategies proposed by Mokhtari and Sheorey (2002).

These scholars state that students could enhance their reading comprehension with the help of some reading strategies which are global, support and problem-solving (refer to Figure 1).

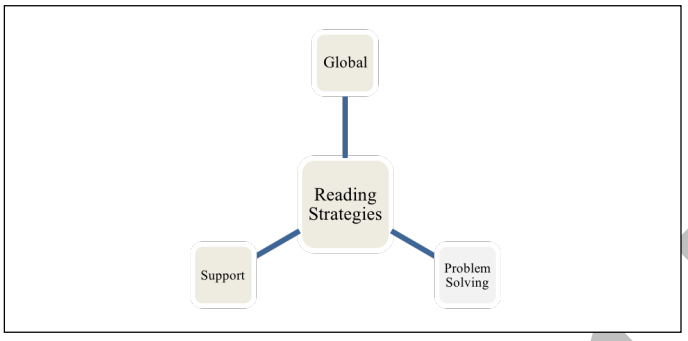


Fig. 1: Reading Strategies
Source: Mokhtari and Sheorey (2002)

According to Mokhtari and Sheorey (2002), Global Reading Strategies are mainly used for pre reading activities which students employ to manage and plan their reading. Support Reading Strategies include activities that involve the production of outside materials or references from the reading text such as notes containing important information. Problem-Solving Strategies refers to functions that readers utilize when they attempt to overcome reading difficulties during the reading process, including the manner in which they do so. Figure 2 illustrates the list of these three reading categories.

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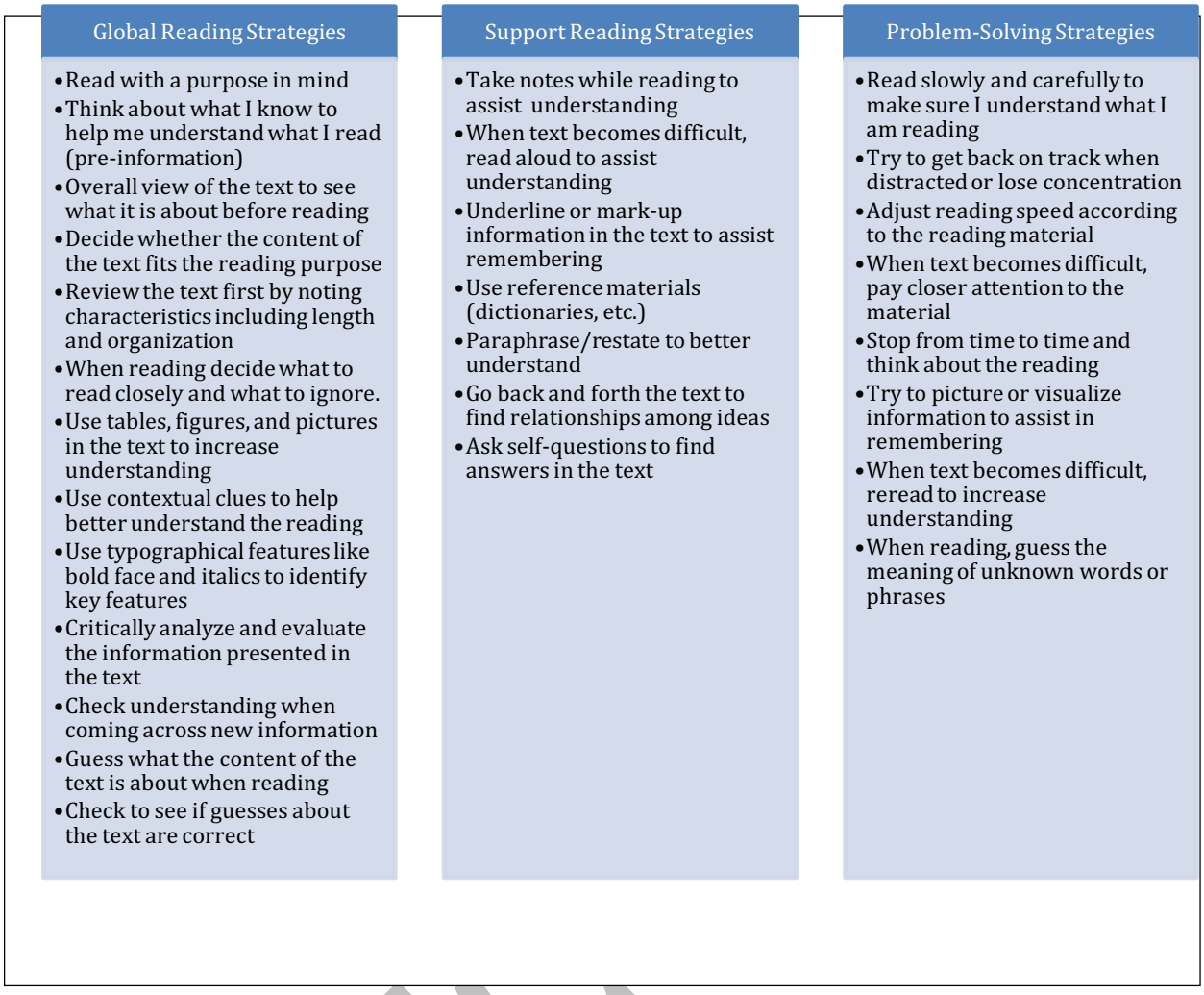


Fig. 2: Reading Strategies
Source: Mokhtari and Sheorey (2002)

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Theoretical Background

Yahya (2008) relates hypermedia reading to cognitive constructivist theory which is derived from Swiss developmental psychologist, Jean Piaget. Jean Piaget 1970) stated that students would be able to produce their own understanding when they become mentally active in their own reading. In the case of this study, participants would become active constructors of their own knowledge while experiencing the hypermedia reading activity.

Jordan et al. (2008) state that before readers could get in-depth understanding of the text, they would go through 3 processes of active reading; explore, derive meaning and extend their own knowledge. In addition, according to Anderson and Lynch (1988), as the readers experience the three processes, they employ three main sources of knowledge during their reading which are schematic, contextual and systemic . They also add that during the process

of understanding the reading materials, the three sources of knowledge will interact with each other. During the process of reading, readers who encounter new objects or ideas in the reading materials can develop a new understanding or knowledge and relate it with previous knowledge.

Constructivists also believe that knowledge is constructed not inherited from another individual (Anderson & Lynch, 1988). They further suggest that learning should be a student centred process. In hypermedia reading, with little assistance from the particular teachers, readers could employ prior knowledge to relate and adapt to the new knowledge that comes in the form of audio, video, picture or even plain text independently (David et al., 1999, Maslawati (2012). adds that the process of adaptation will allow the readers to obtain better understanding of the hypermedia materials and therefore more in depth knowledge of the topic.

Past related studies

Anderson's (2003) conducted a research involving 131 EFL and 116 ESL learners of different proficiency levels. The objective of his study was to compare online metacognitive reading strategies employed by these two groups. The findings show that the top strategy used was rereading the difficult text and the least strategy engaged was translating the reading material into their first language.

Akyel and Ercetin (2009) conducted a study that involved 10 advanced English learners. The researchers studied the differences between hypermedia reading strategies and reading strategies of printed materials. The results indicate that there are little differences between hypermedia reading strategies and printed reading strategies. Further in the study, the researchers also revealed that the learners with high prior knowledge used several cognitive and metacognitive strategies. On the other hand, low prior knowledge learners made use of the annotations which appear in the website. Annotations provide additional information to enhance learners' understanding of the hypermedia materials.

Maslawati (2012) explored reading strategies used by adult learners. Her study involved 5 off-campus participants from Allied Sciences Faculty at Universiti Kebangsaan Malaysia (UKM). She utilized four types of research instrument namely semi-structured interviews, survey questionnaires, observations and observation checklists and document analysis. Her

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findings showed similar strategies being adopted which included cognitive, meta-cognitive, socio-affective and navigational strategies. Her findings also revealed that her participants experienced physical difficulties associated with navigating the web which included strained eyes, attractive yet irrelevant advertisements and too many illustrations.

Thus far, there are few researches that have been done on TESL students to explore their hypermedia reading strategies in reading TESL related materials in local context. This study is aimed at reducing the literature gap in this domain. TESL students were chosen because it was seen that their coursework required reading hypermedia materials. As the study was aimed at getting data relevant to hypermedia materials and reading strategies it was decided that the selection of TESL students would enable the researchers to obtain the necessary data.

RESEARCH METHODOLOGY

This study employed a qualitative approach particularly a case study. Case study was selected as the approach because the researchers' main concern was on exploring the reading process at length of multiple individuals in a group of people rather than understanding the outcomes or products of the phenomena (Yin, 2009; Creswell, 2009). The researchers' intention was to describe TESL students' reading process which is the image of human reality or what people actually do. In doing so, this qualitative study involves field work and the researchers become the primary source of data collection and analysis. During field work, in order to capture the natural setting, the researchers went to conduct the study at the participants' rooms at a time convenient to the participants. The researchers carried out semi-structured interviews and observations, transcribed the interview responses, and carried out the reliability and validity measures before analyzing the data. As this is a qualitative study, the researchers developed abstraction or concepts that emerged from the data rather than tested any hypotheses.

As to identify the reading strategies employed by TESL students, Think Aloud Protocols (TAP) was the main instrument used to gather the information. For triangulation purposes, other research tools namely interview, observation field notes and reflective notes were utilized too.

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Participants

In this case study, the researchers employed purposive sampling. Purposive sampling was selected because the researchers intended to "discover, understand and gain insight from a sample from which the most could be learned" (Merriam, 2009: 79). These students were selected as they fulfilled the characteristics which the researchers had determined to study based on the purpose of this study – that is to identify TESL students' hypermedia reading strategies. There were a total of 28 Year 3 undergraduate TESL students who enrolled in the English course namely Teaching of Reading Skills in an ESL Context. Twelve of these students volunteered to participate in this study but only eleven remained committed until the end. According to Merriam (2009), only volunteers should be accepted to take part in a qualitative research in order to conform to research ethics. As this is a case study, eleven participants can be considered sufficient since the main aim is to understand a certain phenomenon through the accumulation of rich and in depth information. In order to sustain anonymity and confidentiality, as well as observe qualitative research ethics, each participant was given pseudonym (Given, 2008). This was explained to the participants prior to the study. The participants were also assured that only pseudonyms would be to protect their privacy (Angrosino, 2000). All the participants gave their consent and they penned down their signature on a consent form.

All TESL students must obtain at least Band 3 or 4 in the Malaysian University English Test (MUET). MUET is an English test created by the Malaysian government to set a benchmark of English proficiency for Malaysian students. Students scoring Bands 3 and 4 are considered as modest and competent users of English respectively. All participants are female and their age range is between 22-24 years old.

The course: Teaching of Reading Skills in an ESL Context

All third year TESL students had to take this course to fulfill the university requirements. The objectives of the course were to introduce and familiarize the students with the major aspects of reading theory, research, and instructional approaches and techniques related to the ESL teaching and learning situation.

Data Collection Tools

Think Aloud Protocols (TAP)

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In this study, Think Aloud Protocol (TAP) was utilized as the primary data collection technique. It was chosen as the main data collection technique because of its advantages. TAP enable researchers to get an in-depth view of the reading strategies employed in a given, ongoing task as the participants read aloud the reading strategies that they utilized when reading a hypermedia material (Ketabi et al., 2012). As part of the course requirements, the participants were instructed by the lecturer to read about Reading Models from any TESL-related hypermedia texts in relation to the topic. Using TAP, the participants were asked to orally express, either in English, Malay or both, the process they went through reading the texts. What is paramount here is that the participants should feel as comfortable and as confidently as possible doing this without being threatened by the language (Perakyla 2000). All participants went through approximately 30-minute TAP session. Their oral expressions were recorded using a digital voice recorder. The recordings were transcribed in verbatim.

Semi-structured Interviews

A semi-structured interview was carried out with every participant simultaneously with the Think Aloud Protocols for approximately 30 minutes (see Appendix A) The interview session ran simultaneously with TAP session in order to encourage the participant to express their reading process as frequently as possible. Without much probing the participants tend to practice silent reading. The purpose of the interview was to get more in depth insights to the participants' general overview regarding the task given and as a means to explore the participants' thinking during the reading process. They also served as a means to find out the participants' views regarding their own reading process in relation to the hypermedia texts and associated websites. The interview responses also served as a means to confirm the researchers' observations, the verbal expressions in the TAP and to discover information on mental activities that could not be observed (Patton, 1990).

Observations

Aside from conducting semi-structured interviews, observation was also carried out in order to explore the participants' reading behavior and other gestural cues. This is in line with Angrosino's (2000) viewpoint which is observation is an effective tool to explore and examine the human behavior. Patton (1990) mentioned that the purpose of observational data is to describe the setting that was observed, the activities in that setting and the meanings of what were observed. The participants observed individually while reading the hypermedia reading materials. The observation data were documented as field notes.

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Reflective Notes

In the reflective notes, the participants were asked to articulate their personal opinions and feelings towards the reading texts and websites, problems encountered and the strategies they employed to overcome any reading difficulties. Reflective notes are able to capture certain information regarding the participants' opinions, feelings, needs and fears which might not be able to be captured during interviews (Ortlipp, 2008). Ortlipp (2008) argues that respondents are consciously acknowledged their actions, thoughts and values when they write reflective notes.

Reliability and Validity

As put forth by Denzin and Lincoln (1994) in Silverman (2000), validity could be divided into two subcategories namely internal and external. Yin (2009) notes that in a case study, measures to ascertain the validity and reliability need to be applied throughout the conduct of the case study. Two measures which the researcher had undertaken to ensure reliability and validity are triangulation and participant validation. Triangulation refers to a combination of a few data collection techniques or data sources in the same design (Stake, 1995). Triangulation serves to examine the consistency of different data sources (Patton, 1999). Hence, the findings of each research tool are confirmed by other research tools. In this study, the researchers employed three data collection techniques namely TAP, semi-structured interviews, observations and participants' reflective notes. The interviews were conducted immediately after the TAP and observation as the researchers intended to counter check their observations with the participants' interview responses.

Participant validation refers to returning the transcripts and researchers' field notes to the participants to review the researchers' interpretations for accuracy and palatability (Trochim, 2006). It is meant to reduce three possibilities (a) Misinterpretation of the participants' behavior during observations (b) Biasness (c) Lack of data. After participants had read the transcripts and field notes, the researchers asked the participants to sign a form. If there was any mismatch in interpretation, the participants would be able to correct and provide explanation to the researchers. Based on the participants' feedback, the researchers made the necessary rectification. This effort facilitated the researchers' efforts at better capturing the participants' perspectives and ensuring that plausible interpretations were made (Merriam, 2009). In addition, this move also enabled the researchers to assess if more data needed to be obtained such as the need for more interview data that can be analyzed and compared

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throughout (McMillan & Schumaker, 1984) until a 'saturation point' was reached (Strauss & Corbin, 1998). Saturation point is reached when no new information could be discovered.

Data Analysis

In this study, the researchers analyzed the data in three main phases. The phases are (a) Data transcription (b) Data coding (Encoding scheme) (c) Data analysis. It is important to note that the process of collecting and analyzing the data in this study was dynamic and recursive. Transcribing refers to the process of transferring the data from audio form into textual form (Dornyei, 2007). The data accumulated in the study were coded and categorized into themes and subthemes. This phase utilized a process known as encoding scheme which required the researchers to rearrange the data, recode, restructure and finally interpret them. This is a recursive process in tandem with Miles and Huberman's argument that the data analysis should be recursive taking place between 'concrete bits of data and interpretation'. The process of coding the raw data ran simultaneously with the construction of new categories so as to capture the relevant characteristics of the content of the documents in questions. The coding process was done using NVivo 10. The researchers had earlier classified the reading strategies according to Global Reading Strategies, Support Reading Strategies and Problem Solving Reading Strategies based on the categories of reading strategies proposed by Mokhtari and Sheorey (2001). The step that followed was comparing the categories across all the subsequent interviews, TAP, reflective notes and field notes.

FINDINGS AND DISCUSSION

Reading difficulties and techniques taken to overcome them

This section highlights the participants' reading difficulties and strategies they took to overcome their reading difficulties.

1. Unfamiliar words or terminologies

From the researchers' observations, reflective notes and interview responses, every participant encountered difficulty with words and terminologies. All participants stated that one of the difficulties they faced was to understand the meaning of the unfamiliar words or terminologies. As reflected by Participants A and H in their reflective notes, "Therefore, I tried my best to read the text but **there are some words and terms that I did not understand**" and "…the only difficulty I encountered all the time is that sometimes **I don't**

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understand some of the words written in the websites". From the interview responses, Participant D also mentioned the same difficulties, ("**Yes, some of them, the words I don't understand.**")

In order to solve the problem, a few participants made use of search online dictionary, in particular Merriam Webster and DictionaryReference.com. This statement is derived from Participant G and E's interview responses, "**Okay, like this, I just simply open every link here. So, I go first for Merriam Webster." and "…there is a lot of links and then I choose one which is a DictionaryReference.com**." Here, it can be said that the participants employed Support Reading Strategies whereby reference materials such as dictionaries were used to assist them with this particular vocabulary problem.

Aside from online dictionaries, the participants also claimed in both their reflective notes and interviews that they used 'Google Translate' to search for the meanings of the unfamiliar words given the function of 'Google Translate' in translating unfamiliar words into the participants' native language. This seemed to be a convenient tool for the participants, as expressed by Participant H in her interview responses, "…because it (Google Translate) **translate directly into Malay.**" Observation done by the researchers also showed that other participants also used the same strategy as they read online. The findings of this research are comparable to Shen and Huang's (2003) findings where they discovered that EFL learners always use online dictionaries and translate the unfamiliar words into their native language. In the case of the study, the process of translating the unknown words had helped them to get a better understanding of the online reading materials.

The third technique was making use of contextual clues which the researcher categorized under Global Reading Strategies. Participant J stated In her reflective that to overcome difficulties with unfamiliar words she "…**read the whole text and just guess the meaning of the words based on my logic thinking.**" The researcher noticed from observation that participants would read in much slower pace when there were issues in meanings of words. They would reread the same paragraph multiple times making contextual clues along the way using the surrounding words or sentences and neighboring paragraphs with the intent of making guesses and inferences and getting more comprehensive overview of the content. The process of rereading showed that the participants utilized Problem-Solving Strategies.

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Not only did some participants made use of contextual clues, they also slowed down their reading pace when encountering difficult paragraphs. In this case the participants can be seen to be reading slowly and carefully to make sure they understood what they were reading. From the researchers' observations, this 'problem solving' strategy was employed by most participants thus it can be said that that a reader varies her speed and whole manner of reading according to the ability in comprehending the targeted material as argued by Nuttal (2005).

In addition, participants also employed other strategies to get at the words' meaning. The strategies include searching for the meaning via Google search engine, using prior knowledge, asking other people who know the meaning of the unfamiliar words, and using the given links to refer to other websites.

2. Distraction from advertisement/advertisements

Data shows that six participants reported that the advertisements on the websites were distracting. So during the reading session rather than concentrating at the main hypermedia materials or hypertexts, the participants also went through the advertisements. For example, Participant G had this to say during the interview: "…**the advertisement** really annoyed me because it is like **disturbing my time to finish the task or thing**…" In her reflective note, Participant G also gave similar remark, "…**I think the advertisements are not needed** there as it will disturb the process of reading where it **distracted the reader from being focus on the text.**" Participant E concurred with Participant's G statement as she mentioned in her reflective note, "I am **easily distracted by the ads** or other tabs opened at that particular time of reading."

Some of the participants overcame the problem in a few ways. Participant G explained that, "**I just simply click err… the 'exit' symbol.**" Meanwhile, Participant C chose to install AdBlock extension to the web browser in her laptop in order to block the advertisements. On the contrary, Participant F would rather close the website and find another website that does not contain any advertisements. The findings are parallel with Maslawati's (2012) findings in that three of the participants in her study stated that the advertisements appeared in the websites distracted them from focusing on the main text and mentioning that the advertisements were irrelevant. However, in spite of this, the concerned participant could not stop reading the information in the advertisements.

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3. Not able to fully comprehend the hypermedia documents

During the reading process, at times, the participants also faced difficulty fully comprehending the hypermedia texts. According to Participant A during the interview session, "I **don't understand some part of it…**" Another participant also made the same complaint in her reflective note, "I **don't understand some of the points.**"

From researchers' observation, it could be seen that the participants adopted a strategy which is categorized under Global Reading Strategies whereby they referred to pictures or images in the websites as if to help them develop better comprehension of the hypermedia reading materials. The researcher's observations were later confirmed by the participant's interview responses. Participant A highlighted in the interview responses, "Sometimes I also **use the Google image to help me have a better understanding** of the reading model topic."

Most participants admitted that they used prior knowledge to aid reading comprehension. The researchers categorized this strategy utilized under Global Reading Strategies. One of the participants claimed in her reflective notes that this strategy could trigger her schemata about the topic. All participants had learnt about Reading Models in their coursework lectures and tutorials therefore making use of this knowledge to develop better comprehension of the hypermedia materials. Moreover, they also had other online sources to turn to such as reading materials on Reading Models from other websites. Here, the participants also employed one of the Support Reading strategies when they reffered to other reference materials during the reading process. The knowledge they obtained through these websites, particularly 'SlideShare' facilitated their reading process, and ultimately increasing their level of comprehension. The result of this study supports previous studies (Anderson, 1991; Akyel & Ercetin, 2009) that in order to construct the meaning from the text, readers refer to their prior knowledge. These findings are in line with Tricia's (2000) notes; formal schemata assist readers in understanding and interpreting the hypermedia documents.

One of the participants also made use of the 'Discussion or Comments' column written by previous readers on the website. The participant read this column because she believed that other readers would provide further explanation on the topic.

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4. No Internet connection or low bandwidth

Clearly, from the participants' explanations, facility such as good Internet connection is very important for reading hypermedia texts. Four participants agreed with this. They believe a good Internet connection would be very useful if they were required to find the reading materials online. They added slow Internet connection would demotivate them as they would have to consistently search for and read and re-read the hypermedia materials. As pointed out twice by Participant D during the interview session, "**It (slow internet) will demotivate my interest…**" and "…if we **don't get Internet connection,** we will get angry and we **lose the interest to read.**" Participant F also complained about the same thing, "**…when there is some problem with the internet, I became lazy to do anything related to researching.**" The findings corroborate Park and Bonk's (2007) findings where it was found that among the challenges or difficulties of reading in an online environment is also Internet connection problem. This problem had a bad effect on the students' academic performance.

Since the problem of this kind is beyond the capability of the participants, there was nothing much that they could do to resolve it. However, a few participants explained the initiative that they took. For example, Participant J mentioned that "If the Wi-Fi is not okay, I will **go to the library and use the references in the library** to complete my task." Meanwhile, Participant D would like to take a step by thinking positively and check on the Internet connection after a 10-minute break.

5. Strained eyes

Two participants considered strained eyes as another problem. As stated in their reflective notes, "…the **online text often gave me an eye sore** when I took long time to read." and "**The eyes are strained when I am reading too close to the screen or too long scrolling a page…**" They added due to this problem, it had become a distraction because during the reading process they needed to stop reading for a moment to rest their eyes. To support the statement made by the participants in their reflective notes, the researchers' observation revealed that one of the participants simply put down her glasses and rubbed her eyes at the end of the reading session. This is not an uncommon situation as the findings obtained by Maslawati's (2012) in her study on hypermedia reading strategies of adult learners showed that one of the contributing factors that led to strained eyes was the continuous activity of scrolling through the online texts. She added that this problem has caused the readers in her study to either just stop reading or read the text very fast later losing interest and

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concentration. In comparison to adult learners, the participants of this study took longer time to experience strained eyes.

As a solution, the participants in the present study preferred to print out the hypermedia reading materials and read the hard copy versions. Instead of reading too close to the screen, the participant also transferred the text into Microsoft Word. In the Microsoft Word, they could enlarge and change the font style that suited their reading needs. As stated by one of the participants that encountered this problem, "I also sometimes **transfer the text into Microsoft-Word**. In Microsoft Word I can **enlarge the letters** and I can **highlight the points**…"

CONCLUSIONS

Findings of the study indicates that in many ways the hypermedia reading strategies utilized by the participants were similar to those adopted when reading printed texts. However, it can be seen that the participants sought to utilize strategies which are characteristic of online reading. In general all three strategies, specifically Global Reading strategies, Support Reading strategies and Problem Solving reading strategies were used but with varying degrees.

Support Reading strategies appeared to be the most sought out as the participants were reading the hypermedia materials given the sources of support which were readily available online, and at the click of the button. The links to other websites seemed to work in favor of the participants as and when they encountered problems by taking them to other sources of support facilitating their understanding of the reading materials, and hence the given topic of the course reading task. It is not clear from the data if these support strategies facilitated faster reading, but it can be surmised at this point that reading hypermedia materials also require some facilities with navigating the websites and for these sources of support. As for global reading strategies, it is fair to conclude based on the findings that the participants employed the strategies in the same way as they would reading printed materials. As to whether Global Reading Strategies were different when reading hypermedia materials cannot be determined here based on the available data but further research on this could shed light on the extent to which global reading strategies are media dependent.

Global Reading strategies appeared to be the most strategies that have been utilized by the participants because based on the findings, the participants employed the strategies in the

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same way as they would reading printed materials. However, as to whether Global Reading strategies the differences when reading hypermedia materials cannot be determined here based on the available data but further research on this could shed light on the extent to which global reading strategies are media dependent. As for Support Reading strategies, they appeared to be the second most sought out as the participants were reading the hypermedia materials given the sources of support which were readily available online, and at the click of the button. The links to other websites seemed to work in favor of the participants as and when they encountered problems by taking them to other sources of support facilitating their understanding of the reading materials, and hence the given topic of the course reading task. It is not clear from the data if these support strategies facilitated faster reading, but it can be surmised at this point that reading hypermedia materials also require some facilities with navigating the websites and for these sources of support.

The other difficulties reported in the study were physical in nature having to do with internet connection and eye strain, although the ways with which these were handled could not be said to be strategies for reading, but more making things better for them. Based on the result derived from this study, it is hoped that it will help the parties involved: course designers, teachers/facilitators and students in the following way: Course designers could create or select reading websites with built-in features that would assist the students to read efficiently. For example there should be 'buttons' or 'drop down menu' that take students to reading tools such as 'hyperlinks' available online. Teachers or facilitators could identify the students' learning styles and needs. They can guide their students to read efficiently by promoting and suggesting suitable reading strategies that can help students to obtain as much content as possible from the hypermedia reading materials assign in the course. As for students, the findings will provide them with better guidance for utilizing and maximizing upon the different strategies and benefit from them. The advantages of the different reading strategies can help students gain a better understanding of the hypermedia reading materials. It is hoped that this awareness reading strategies would eventually help students to match the strategies according to their reading proficiency, needs and reading preferences.

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I Learn For My Hobby: How Much Are Aquarists Satisfied?

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Abstract

Since smart devices provide mobility convenience, in the field of information technology the need to popularize software applications for mobile/smart devices has emerged. Despite of these developments, web applications still maintain their importance. Therefore, IT (Information Technologies) studies are carried out by paying regard to the both situations for software developers.

Today, for individuals who work in big cities under excessive stress it is very important to spend their free times effectively and to turn free time activities into a relaxing process. The activities performed in this process are called hobby. For beginners, it is generally insufficient to have a desire for the field of hobby and they need additional information for the activity to be performed. It is important for them to know what to do when they encounter any problem. Individuals obtain these essential information through the experts in the enterprises selling hobby materials, websites on the internet, related forums or their friends. In order to maintain hobbies effectively and healthily, it is very important to obtain information only from those experienced in the field of hobby.

In this study, for those who want to take up the aquarium hobby; a basic training platform appropriate for the instructional design principles and that includes the important matters in the maintenance and placement of the aquarium as well as aquarium and fish selection was designed. The platform was developed in a way to be accessed from classical web browsers and mobile devices. The aim of the study is to increase the satisfaction among the learners using web and mobile environment. The content developed in this regard was offered to the study group consisting of users in mobile and web environments. The group was selected from the individuals using popular aquarium forums on the internet according to the principle of voluntariness. At the end of the training process, a satisfaction survey was applied to the learners and the obtained data were analyzed by using a web analysis tool.

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THE STUDY

With the development of technology, the habits of people have also undergone a change. Calculations were used to be made manually or with machines in the past; however, it is today easier and faster to make calculations thanks to the reconnaissance and development of computers. Furthermore, with the emergence of internet, a new page has been opened in the era of information.

The most important characteristic of this era is the continuity of the development. People have started paying much attention to the mobile life with the emergence of smart devices having many brand-new features. Today, the use of smart devices is considerably high across

the globe. With the increase in the use of smart devices on mobile media, mobile needs have also increased in parallel. Thanks to this environment, there has been the opportunity to convey the contents of the training to the people who can perform banking transactions, manage social network accounts easily and carry out many daily activities by using mobile phones.

Learning is an important matter of fact for humanity. From the primitive man until today, people have always had to learn in order to survive. In an environment where information is continuously increasing, it is very important to learn learning. Scientists like Pavlov, Watson, Thorndike, Skinner and Guthrie adopted behavioral approach, defined learning as the change in the possibility of exhibiting a behavior and argued that learning consisted of action, reaction and behavior processes. Bruner, Koffka, Kohler and Lewin adopting cognitive approach explained learning as information storing and information interchange in the memory. Constructivists like Piaget, Vygotsky and Bloom defined learning as the change occurring in the meaning after the formation of new meanings by the individual (Newby, Stepich, Lehman and Russel, 1996: 24-43, cited by Tanrıkulu, 2004, P.2).

People living and working in big cities can take up different hobbies with an aim to reduce stress in their lives and workplaces. Among hobbies related to animals, aquarium hobby is very attractive for those who love animals but are afraid of them or show allergic reactions to certain animals like cats and dogs. However, there are not sufficient number of platforms providing effective information for the beginners. Information found on the internet can be in contradiction with each other. In addition, people working in pet shops can give wrong information because of commercial concerns. Since the importance of technology cannot be underestimated in the information era, it can be useful to convey information from different technological environments as a training healthily with various technological approaches. At this point, according to the definition of Engin, Tösten, Kaya (2010) and Arslan (2003), the need of providing training by using computer aided training which is a process based on the principles of programmed instruction method and supported by software on individual or crowded training environments has emerged.

With an aim to make instructional activities more effective, instructional design models are used. The definitions of instructional design are as follows:

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Merril et al., (1966) argue that instruction is a science and that instructional design is a technology founded in this science.

Instructional design offers explicit guidance on how to between help people learn and develop. The kinds of learning and development may include cognitive, emotional, social, physical and spiritual (Reigeluth, 1999).

According to another definition, instructional design is the process of solving instructional problems with the ordered analysis of learning conditions. An instructional design consists of planning information processing resources, instructional activities, instructional materials and assessment elements in an orderly manner (Fer, 2009).

According to Bilgin et al., (2004) instructional design is about developing functional instruction process in order to fulfill the needs of a certain population. In addition, instructional systems can become more complicated due to the developing technology but they are also indispensable.

ADDIE model is a cult model emerging in the period of the World War 2. Today, ADDIE model is taken as a reference by many instructional design models. Compared to the other models, processes are simpler, more generalized and clear. As seen in Figure 1, ADDIE consists of 5 steps in total. These are Analyze, Design, Development, Implementation and Evaluation respectively (Jones and Davis, 2011).

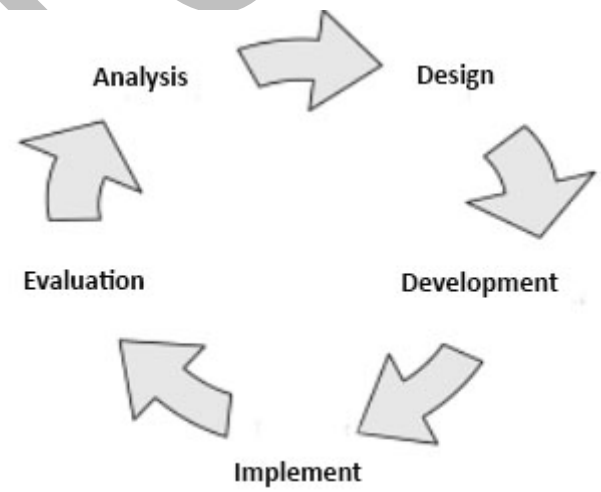


*Figure 1: ADDIE Model (*Jones and Davis, 2011*)*

Learning activities have also changed time-dependently. Formal education which is performed in a certain time and place in schools is now different with the development of

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technology. The developments observed in web 2.0 and instruction technologies have also changed instructional activities. Since smart phones and tablets get high-speed internet service through GMS network, the following question has emerged "Can instructional processes be managed through these platforms effectively?

The following definitions can be found in the literature regarding mobile learning:

Mobile learning is the combination of functionality and portability. There is a process on devices used for e-learning and m-learning in terms of functionality. This process can be simply defined as the provision of education and training on PDAs, palmtops, handhelds, smart phones and mobile phones. As a result, education and instruction are given through PDA, handheld or smart phone (Keegan, 2005).

Mobil learning enables an educational environment by using mobile phones or different mobile devices without depending on the place and time (P.Seppala & H.Alamaki, 2013). From this point of view, the most important part of mobility is that it removes the dependency on time and place. This is the most important difference between mobile learning and web-based learning.

Thanks to the mobility feature of mobile technologies, processes like learning and practice can also be performed outside of the class (Saran, Seferoğlu and Çağıltay, 2009). However, since the screens of mobile devices are smaller and it is more difficult to concentrate in different places, concerns arise with regard to the success of mobile learning.

In their study, Oran and Karadeniz (2007) analyzed the advantages and disadvantages of mobile learning. They argued that mobile learning environments offer time and place-independent learning opportunity to the learner and accordingly mobile contents specific to this field need to be developed.

The effects of individual choices in terms of instructional design on web based learning environments were discussed and the importance of offering different media to students was underline. It was concluded that every student learned in line with his own choices (Gülbahar, 2005).

In their study, Yabaş and Altun (2009) obtained positive and significant results within the scope of academic achievement test, knowledge, comprehension, practice, metacognition skills and self-sufficiency perception of differentiated instructional design.

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In their study, Şimşek, Özdamar et al. (2008) analyzed doctoral theses written about "Educational Technologies in Turkey". They came to the conclusion that the majority of studies focused on only formal education students.

In their study, Menzi et al. (2012) received the opinions of 21 academicians regarding the use of mobile technologies in education. Within the framework of the obtained findings, it was detected that the academicians had positive opinions about the use of mobile technologies in education. According to the obtained data, the use of mobile technologies in education will increase if technical support, infrastructure and cost problems are solved.

Yünkül and Er (2014) analyzed the effect of the multimedia software prepared according to the ADDIE instructional design model on the attitudes of students. It was detected that the attitudes of students learning with multimedia changed in a positive way. According to the researchers, the reason of this positive change was that the multimedia software was developed with an instructional design model and multimedia added richness to the process.

As mentioned by İşman (2002), today's education system will fall behind if it cannot use or keep up with educational technologies. From this point of view, it can be stated that the role of technology in education is very important and e-learning should be improved in line with the new technological developments. Distance education is seen as an alternative to formal education which cannot be properly offered because of certain impossibilities and distance education can be successfully offered in Turkey conditions (Çallı, İşman & Torkul, 2001). In addition, the effects and differences of learning contents offered on immobile environments and e-learning contents offered through mobile are still issues of concern.

METHOD

Sample

The population of the study consists of all individuals who have started or are interested in aquarium hobby. As sample, 67 individuals, members of the aquarium websites popular on the internet or voluntary to take part in the learning process were included in the study.

Limitations

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One of the popular aquarium forums on the internet was accepted as the population in this study. The mobile application was developed only for Android operating system. Aquarium learning process was divided into 5 categories: aquarium and fish selection, place selection, installation, fish placement and general maintenance. Learning content was offered for 2 weeks to the participants from Turkey.

Tools

As data collection tool, a satisfaction survey was used. The survey was applied to the participants within the sample on a digital media. In addition, Google Analytics and user experience tools Lucky Orange, MouseFlow and Appsee software were used. These software are applications that record and consolidate mouse-keyboard and scroll movements of users as heat map. 7 days trial version of Lucky Orange, 14 days trial version of Appsee software and MouseFlow's plan recording 100 logins were used. Google Analytics is a free service. By benefiting from this service, data were collected regarding certain issues such as the time users spend on the contents, mouse or scroll movements.

Instructional Design

ADDIE was used as the instructional design model in this process which aims to teach the individuals interested in aquarium hobby how to create an ecological balance in the aquarium and maintain this balance as required. The fundamental reason for choosing ADDIE model was because it is generic and open to adaptation-development.

Implementation of Instructional Design

In addition to the general design pattern in ADDIE model, the process was divided into modules and every module was designed with a similar template in itself. The assessment was planned to be made for each module and in this way feedback was quickly received. As a result, it became easier and quicker to proceed to the next step. Furthermore, the learner was offered the opportunity to choose through different media as video / text instead of one media. Instructional design was performed by following the steps listed below:

a) Analysis: In this step, the basic knowledge the beginners should have and the mistakes they make were analyzed. As a result of the analysis, it was decided that the beginners should have the acquirements given below. According to this, a person who completes the education and learning process can:

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- say the commonly fed fish species and aquarium volumes for these species
- explain the most basic living conditions for the commonly fed fish species
- explain that freshwater and saltwater aquariums have different requirements
- know the appropriate temperature values for the commonly fed aquarium fish species
- determine the appropriate feeding form for the fish species he wants to feed
- express the effects of slope, sunlight and weight while choosing the place of the aquarium
- solve the problems regarding the rough surfaces for the place of the aquarium
- find the most appropriate place in the room for the aquarium
- choose the necessary equipment for the aquarium correctly
- place the necessary equipment and adornments in the aquarium correctly
- explain what features the aquarium water should have
- explain the terms like heater, filter and nitrogen cycle
- place the aquarium water without damaging adornments
- put the newly-bought fish in the aquarium healthily
- make the general cleaning of the aquarium
- identify water change frequency and amount correctly

As a result of all these acquirements, individuals will be able to start the aquarium hobby correctly, supply the fish species to be fed and maintain the hobby in a healthy way.

b) Design: For the delivery of the educational contents, computer aided instruction was used. It was planned that the learners were going to take the practice through mobile application and web browsers. In order to accomplish the objective, it was decided to provide the education under the modules given below:

- Aquarium and Fish Selection
- Place Selection
- Installation
- Fish Placement
- General Maintenance

There is an introduction section in each module and learners are informed about the objectives. First of all, the educational content is offered to the learners with a video. Video is preferred because learners should be first informed about the processes like aquarium installation or maintenance. Following the video, the content of the instruction is repeated as a text. In this step, the learners review the parts they have missed in the previous step. In the last step, questions asked to the learners whether they have acquired all the essential information

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and if they do not have the necessary information, the steps are repeated until they learn everything adequately.

c) Development: At the development stage of education interface the WordPress, which is an open source content management system, was utilized. Namaste LMS and Watu add-ons, which are effective about publishing and managing the educational contents on the system, were also used. For the ones who are accessing via large-screened, desktop devices a menu with module titles being on the top was prepared. The learners accessing via mobile devices can browse around the modules thanks to a pop-up menu. Each module includes introduction section which informs about aims, video education section, textual explanation section and module assessment questions section in the form of tabs. The user interface can adapt itself to any kind of screen width and can be used hassle-free and without horizontal scrolling, zooming in-out on every device that can connect to the Internet. To enable access to education a Mobile Android application called "Akvarist" was developed and made available on Google Play. This mobile app and web app both provide the same contents to the learners.

d) Implementation: Implementation: The developed education was presented to the participants in the sample for two weeks via http://akvaryum.ogrenirim.com website and mobile app.

e) Evaluation: Five tests were prepared, which evaluate the attainments identified during analysis for each module individually, at the end of each module these tests were applied to learners as multiple-choice questions and each time with different question and option sequences. Instant feedback is given on the wrong answers. Depending on the success level of the test, the learner receives feedbacks whether to repeat the content or to proceed to the next level.

FINDINGS

Data obtained at the end of the study were reviewed under sub titles. The educational content was accessed by 545 individual users for 617 times, including the date June 10, 2015. The average sess-time of the users accessing the education on a web environment was 3.12 minutes while the average sess-time of the users on a mobile platform was 4.35 minutes. During the assessment phase, the answers of 67 users responding to the survey were taken into consideration. As for the survey fill-in rate, 10% of the users accessing the education via

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a web-based platform answered the survey while this rate was 23% for the mobile platform users.

The Demographic and Personal Data Obtained from Survey

As shown in Figure 2, the gender distribution of the users responding to the survey is 74,6% (50 people) Male and 25,4% (17 people) Female.

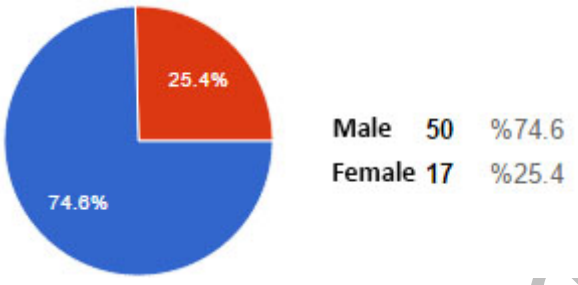


Figure 2: The gender distribution of the users responding to the survey

As shown in Figure 3, the educational statuses of the respondents are respectively: Undergraduate 49.3% (33 people), Postgraduate 22.4% (15 people), High School 10.4% (7 people), Associate Degree 9% (6 people), Doctorate 6% (4 people), and Secondary School 3% (2 people). No primary school graduate took place in the survey.

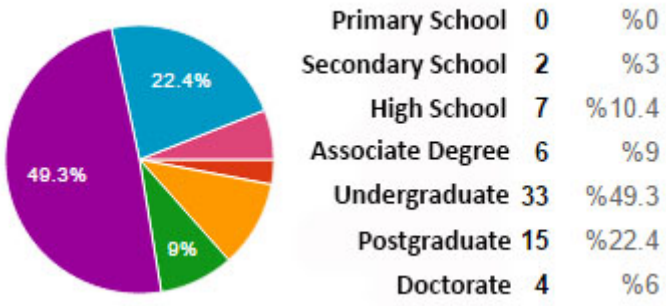


Figure 3: The educational status of respondents

As shown in Figure 4, considering the aquarium hobby engagement time the answers were mainly: I am new to it 60.6% (40 people), 5 years + 18.2% (12 people), 4 years 7.6% (5 people).



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Figure 4: Data on engagement time with aquarium hobby

The Data Obtained In Mobile and Web Environments According to Survey Results

As shown in Figure 5, the rates and device types of access of users accessing the aquarium education platform are: 68.7% (46 people) via Computer (via Web Browser), 31.3% (21 people) via Mobile Devices (Tablets, Smart Phones).



Figure 5: Data on device type to access the aquarium education platform

As shown in Figure 6, 65% (30 people) of the users accessing the prepared platform via a computer based web browser stated that they were pleased with the platform, 26% (21 people) stated that they were partially pleased with the platform, 9% (4 people) stated that they were not pleased with the platform. As for the users accessing the prepared platform via a mobile device, 86% (18 people) of them stated to be pleased with the platform while 14% (3 people) stated to be partially pleased with the platform. None of the users accessing the education environment via a mobile platform stated to be unpleased with it.

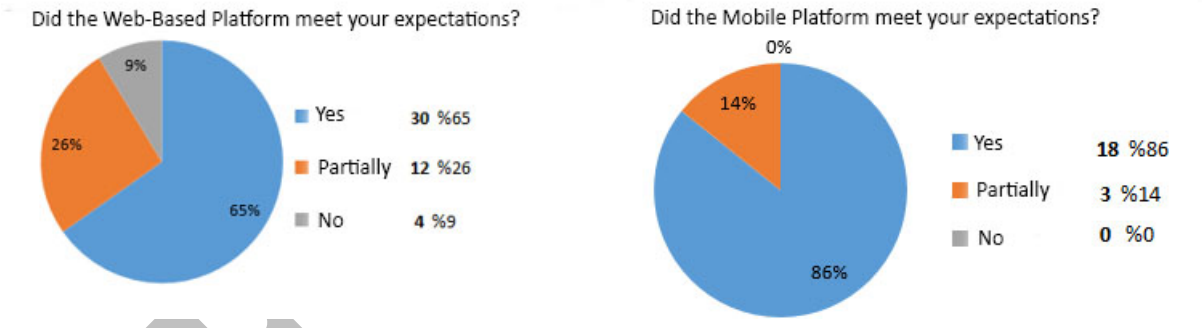


Figure 6: Answers given to the question 'Did the Web-Based Platform and Mobile Platform meet your expectations?'

As shown in Figure 7, 72% (33 people) of the users accessing the platform via a computer based web browser stated that the instructions on the platform were sufficient, 22% (10 people) of those users stated that the instructions were partially sufficient and 6% (3 people) of those users stated that the instructions were insufficient.

As shown in Figure 7, 81% (17 people) of the users accessing the platform via a mobile device stated that the instructions were sufficient while 19% (4 people) of those users stated that the instructions were partially sufficient. None of the users stated that the instructions were insufficient.

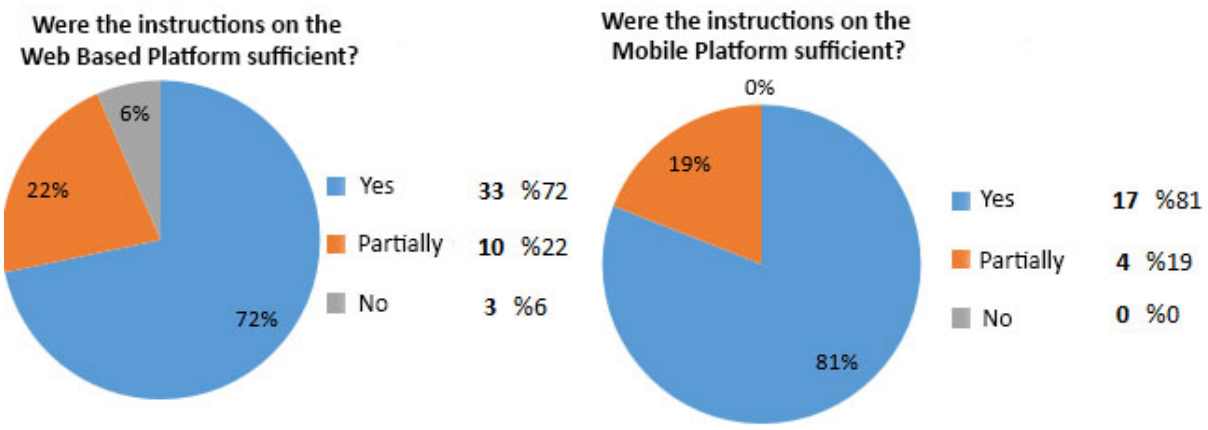


Figure 7: Answers given to the question 'Were the instructions on the Web Based Platform and Mobile Platform sufficient?'

As shown in Figure 8, 87% (40 people) of the users accessing the prepared platform via a computer based web browser stated that they could follow the courses on the platform easily, 9% (4 people) of those users stated that they could partially follow the courses with ease and 4% (2 people) of those users stated that they couldn't follow the courses easily.

As shown in Figure 8, 95% (20 people) of the users accessing the prepared platform via mobile devices stated that they could follow the courses easily, 5% (1 person) of those users stated that they could partially follow the courses with ease.

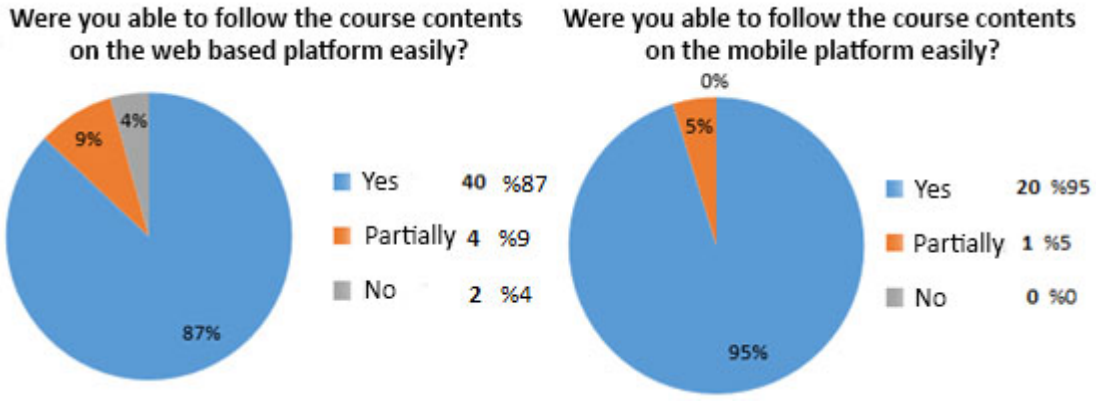


Figure 8: Answers given to the question 'Were you able to follow the course contents on the web based platform and mobile platform easily?'

As shown in Figure 9, 65% (30 people) of the users accessing the courses via a computer based web platform stated that they would like to attend different courses through the platform, 26% (12 people) of those users stated that they would partially like to attend different courses through the platform and 9% (4 people) of those users stated that they wouldn't like to attend different courses through the platform.

As shown in Figure 9, 86% (18 people) of the users accessing the courses via a mobile platform stated that they would like to attend different courses through the platform while 14% (3 people) of those users stated that they would partially like to attend different courses through the platform.

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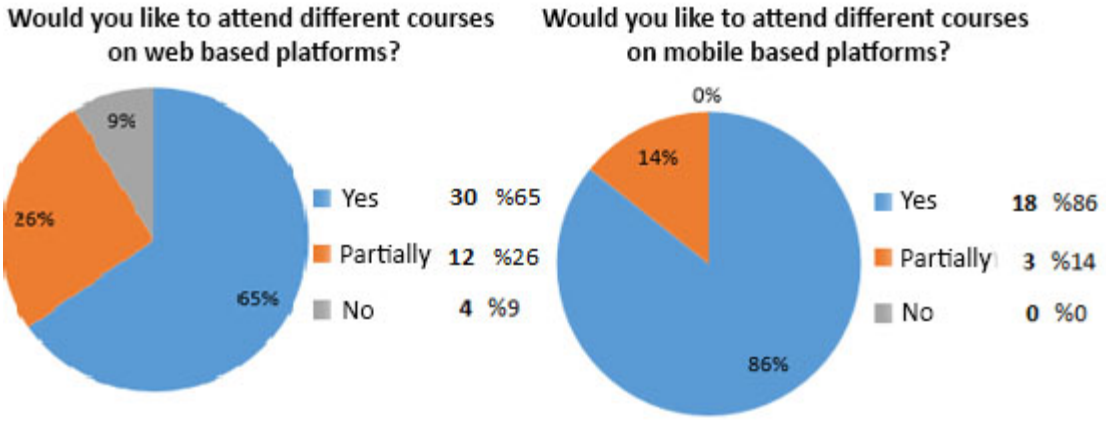


Figure 9: Answers given to the question 'Would you like to attend different courses on web based and mobile based platforms?'

As shown in Figure 10, the scoring according to the evaluations of the users accessing courses via computer based web platform is respectively: 24% (11 people) 8 points, 22% (10 people) 9 points and 7 points, 17% (8 people) 10 points, 7% (3 people) 6 points, 4% (2 people) 4 points, 4% (2 people) 4 points, In parallel with those results, the point average of the web-based environment is 7.82.

As shown in Figure 10, the scoring according to the evaluations of the users accessing courses via mobile platform is respectively: 38% (8 people) 8 points, 28% (6 people) 10 points, 19% (4 people) 9 points, 5% (1 person) 7 points, 5% (1 person) 6 points, 5% (1 person) 5 points, In parallel with those results, the point average of the mobile environment is 8.47.

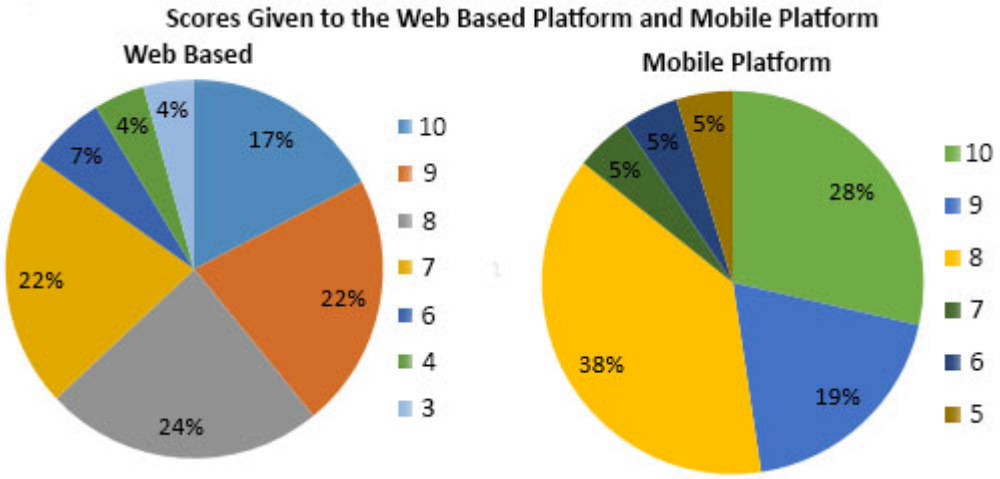


Figure 10: Answers given to score Web Based Platform and Mobile Platform

As shown in Figure 11, 70% (32 people) of the users attending the education service via a web based platform would recommend the platform to others, 24% (11 people) of those users would partially recommend the platform to others and 6% (3 people) wouldn't recommend the platform to others.

As shown in Figure 11, 95% (20 people) of the users attending the education service via a mobile based platform would recommend the platform to others, 5% (1 person) of those users would partially recommend the platform to others.

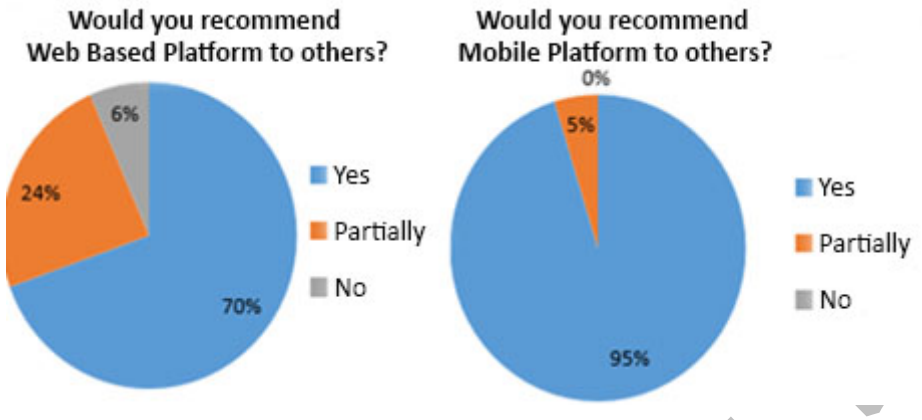


Figure 11: Answers given to the question 'Would you recommend the Web Based Platform and Mobile Based Platform to others?

Data on Education and Contents According to Survey Results

As shown in Figure 12, 64.2% (43 people) of the users stated that course contents are sufficient, 25.4% (17 people) stated that course contents are partially sufficient and 10.4% (7 people) of the users stated that course contents are insufficient.

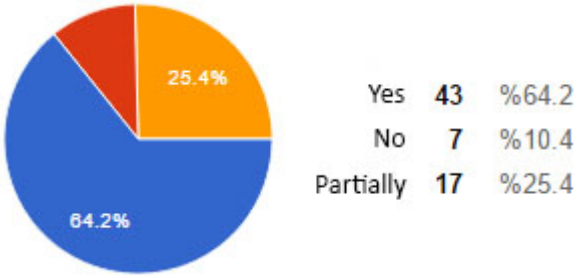


Figure 12: Answers given to the question 'Are the course contents sufficient?'

As shown in Figure 13, 44.8% (30 people) of the users think the exams in the education service are sufficient, 34.3% (23 people) of the users think exams in the education service are partially sufficient and 20.9% (14 people) think the exams in the education service are insufficient.

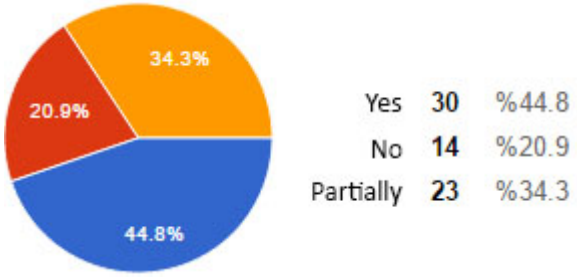


Figure 13: Answers given to the question 'Do you think the exams in the education service are sufficient?'

As shown in the figure 14, 65.7% (44 people) of the users think the feedbacks given in the education service are sufficient, 28.4% (19 people) think they are partially sufficient and 6% (4 people) think they are not sufficient.

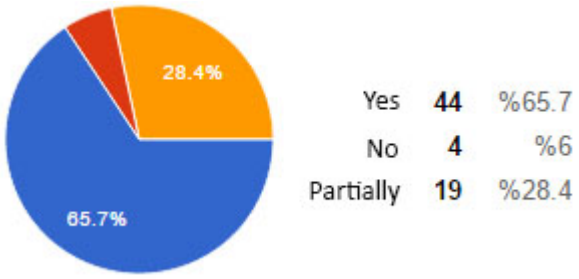


Figure 14: Answers given to the question 'Do you think the feedbacks are sufficient?'

As shown in Figure 15, 76.1% (51 people) of the users stated that the education given helped them learn the subject, 20.9% (14 people) stated that the education given partially helped them learn the subject and 3% (2 people) stated that the education given didn't help them learn the subject.

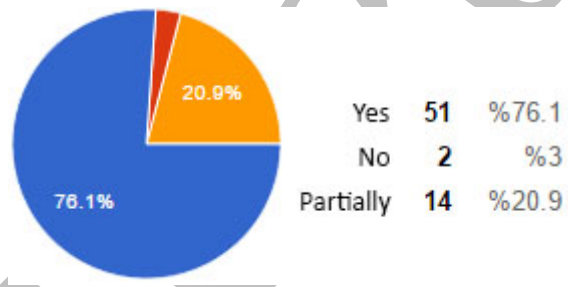


Figure 15: Answers given to the question 'Did the platforms help you to learn the subject?'

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ANOVA Analysis Results

Descriptive Statistics					
		N	Mean	Std. Deviation	Std. Error
Is the content sufficient?	Web	46	2,39	,745	,110
	Mobile	21	2,86	,359	,078
	Total	67	2,54	,682	,083
Is the exam sufficient?	Web	46	2,11	,823	,121
	Mobile	21	2,52	,602	,131
	Total	67	2,24	,780	,095
Are the feedback sufficient?	Web	46	2,48	,623	,092
	Mobile	21	2,86	,478	,104
	Total	67	2,60	,605	,074
Did they help you to learn the subject?	Web	46	2,63	,572	,084
	Mobile	21	2,95	,218	,048
	Total	67	2,73	,510	,062
Do you recommend to others?	Web	46	2,63	,610	,090
	Mobile	21	2,95	,218	,048
	Total	67	2,73	,539	,066

Table 1: Descriptive statistics results according to the accessed platform

IEF

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Is the content sufficient?	Between Groups	3,129	1	3,129	7,388	,008
	Within Groups	27,528	65	,424		
	Total	30,657	66			
Is the exam sufficient?	Between Groups	2,484	1	2,484	4,284	,042
	Within Groups	37,695	65	,580		
	Total	40,179	66			
Are the feedbacks sufficient?	Between Groups	2,070	1	2,070	6,101	,016
	Within Groups	22,050	65	,339		
	Total	24,119	66			
Did they help you to learn the subject?	Between Groups	1,494	1	1,494	6,199	,015
	Within Groups	15,670	65	,241		
	Total	17,164	66			
Do you recommend to others?	Between Groups	1,494	1	1,494	5,497	,022
	Within Groups	17,670	65	,272		
	Total	19,164	66			

Table 2: ANOVA test results according to the accessed platform

When Table 1 and Table 2 are analyzed, it is statistically proved that that there is a significant difference between the answers given by users to the questions “Did you find the content sufficient?” ($F(1, 65)=7.388$, $p<.05$), “Did you find the exam sufficient?” ($F(1, 65)=4.284$, $p<.05$), “Did you find the feedbacks sufficient?” ($F(1, 65)=6.101$, $p<.05$), “Did they help you to learn the subject?” ($F(1, 65)=6.199$, $p<.05$) and “Do you recommend this course to others?” ($F(1, 65)=5.497$, $p<.05$).

Heat Maps and User Experience

By analyzing the results of the heat map, the areas where users mainly interact on the screen were detected. As seen in Figure 16, the areas users clicked on the screen were detected and the areas they clicked wrong were identified.

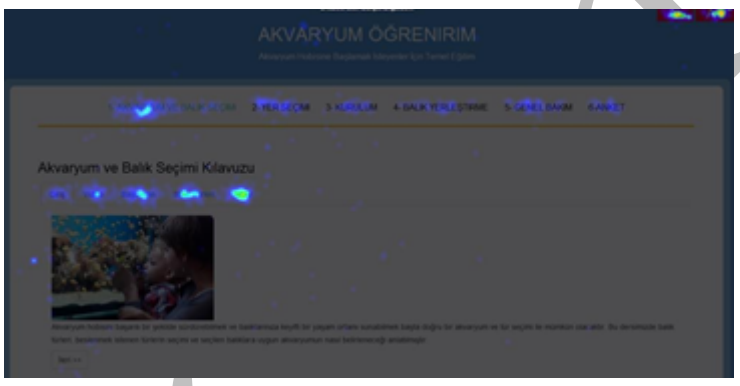


Figure 16: Web Based Heat Map

User Videos, Video Analysis and User Experience

The learners’ screen activities when they received the education were recorded as videos via MouseFlow, LuckyOrange and Appsee tools. By randomly choosing these video records the users’ behaviours on the web based and mobile platforms were analysed, errors were identified and necessary arrangements were done.

DISCUSSION AND CONCLUSION

Considering the findings obtained through the study it is seen that satisfaction level of the users attending the education services via mobile devices is higher. The average session times (mobile 4.35mins, web 3.12mins) and survey fill-in rates (mobile 23%, web 10%) of the users accessing the content via mobile devices is higher compared to the users accessing the content via using a web browser on computer. However, it is seen that although the content is viewed

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by 545 individuals in total 26% of them leave the education instantly and the survey fill-in rate for the users of both environments is 12.3%.

When the ANOVA test results on content, exam, feedback, subject learning and recommendation to others are reviewed, it is seen that there is a significant difference between the mobile platform users and web platform users. The mobile platform users have higher satisfaction levels regarding the sufficiency of the content, exams and feedbacks. Moreover, mobile platform users' opinions on the effectiveness of the content in terms of learning the subject and recommending it to others have higher rates. These outcomes are considered as sympathy created by the fact that people see mobile platforms more popular and lovely and do not encounter these kind of works on mobile environments so often. Moreover, it is estimated that the ability to reach the content via mobile devices at any place and time effects the outcomes.

For the online education services, when institutions restrict the access to the internet contents to only one general application this creates a transmission problem. Having analysed the complaints gathered in this study, it is seen that individuals using the Internet access provided by the Turkish Ministry of Education cannot open the educational videos.

The educational content provided does not contain any activity which would require superb physical keyboard and mouse usage capabilities. The user satisfaction was measured mostly in terms of focusing and availability. Success of other educations, such as programming trainings which would require physical keyboard and mouse usage, can be analysed by other studies.

The comparison of learners' satisfaction in terms of accessing the contents in mobile and web environment can be carried out with bigger study groups and different curse contents.

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Identifying The Gender Difference Of Attitude Towards E-Learning In Hong Kong Higher Education

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Abstract
The purpose of this study is to investigate the gender difference of attitude towards e-learning in Hong Kong higher education. Questionnaire survey was employed and 153 questionnaires were collected. The findings showed that there is no gender difference of attitude toward e-learning.

INTRODUCTION

E-learning has become an important part of education and has become a trend which instructors are trying to educate the next generation with e-learning tools. Web technology and internet have also grown up with an unprecedented speed allowing people to get access to different kinds of information easily.

Males surpass females in the experience of computers and information technology and males possess positive attitude toward them (Liaw & Huang, 2011). Males and females have different approaches toward computers (Colley, 2003).

However, it seems that no study have done to investigate the gender difference of attitude towards using e-learning in Hong Kong higher education. The purpose of this study is to fill this research gap and answer the research question "what is the gender difference of attitude towards e-learning in Hong Kong higher education?"

LITERATURE REVIEW

There were several people have pointed out that there are two types of attitudes: 1) Attitude towards an object, and 2) Attitude toward a behavior on the object (Zhang, 2007). Attitude toward an object is defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Johnson & Boynton, 2009, p. 2).

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Attitudes toward behavior is defined as "an individual's positive or negative evaluation of performing the behavior" (Abbasi et al., 2013, p. 164). Furthermore, Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) suggested that attitude toward behavior consists of two components which are "Beliefs" and "Evaluation". Therefore, attitude toward behavior is formulated as: $A = \sum b_i e_i$ where b_i is the sum of product of all salient beliefs about consequences of performing that behavior, and e_i is the evaluation of those consequences (Chuttur, 2009). Also, attitude is the component in both TRA (Ajzen & Fishbein, 1980) and technology acceptance model (TAM) (Davis, 1986) measuring the intention. Moreover, attitude toward computer is defined as "a person's general evaluation or feeling of favor or antipathy toward computer technologies and specific computer related activities" (Kutluca, 2011, p. 2) proposed by Smith, Caputi & Rawstorne (2000). In this project, attitude towards e-learning is applied. Since e-learning is a kind of computer technology, I define attitude towards e-learning as "a person's general evaluation or feeling of favor or antipathy toward e-learning".

There are some previous studies showed that males surpass females in the experience of computers and information technology and males possess positive attitude toward them (Liaw & Huang, 2011). Colley (2003) suggested that males and females have different approaches toward computers. Males are more likely to treat computers as toys or as technology to be mastered. Females are more likely to treat computers as tools to assist their work. Therefore, I hypothesize:

H1: There has a significant gender difference in learners' attitudes toward e-learning.

RESEARCH METHODOLOGY

Questionnaire survey was chosen as the research method in this study to collect necessary data to examine the gender difference of attitude towards e-learning in Hong Kong higher education. The variable "Attitude" (Table 1) was used in the questionnaire. The variable "Attitude" consists of seven questions (Table 1) which were derived from Jan et al. (2012). Lee (2010) and Sun et al. (2008). 7-Point Likert scale was applied in this questionnaire, as Likert scale often used to ask people to state their agreement with a statement. 7-Point Likert

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scale consists of 7 options for each question. “1” represents “Strongly Disagree”; “4” represents “Neutral”; “7” represents “Strong Agree”.

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Table 1
Items of questionnaire (Attitude)

Question	Items	Factor Loading	Cronbach's Alpha
1.	I believe that using e-learning is very easy	0.793	
2.	I believe that using e-learning is very simple	0.805	
3.	I believe that using e-learning does not require computer knowledge	0.646	
4	I believe that using e-learning makes a person productive at his/her learning	0.712	0.874
5	I believe that using e-learning is a good idea	0.824	
6	I believe that using e-learning is pleasant	0.686	
7	I believe that using e-learning is a wise idea intention	0.764	

The questionnaire was started to develop when the research model was finalized. When the distributable version of questionnaire was completed, pilot test was conducted. The purpose of pilot test was to ensure that the subjects can understand the questions and also understand them in the same way. 14 questionnaires were distributed to my friends who are currently studying the same major in the same university. Those pilot test participants have marked down the grammatical mistakes, the questions that they were not understand and they had also commented on the questionnaire. Based on their comments, the questionnaire was modified and carried out the second pilot test to ensure that the questionnaire can reach the purpose. The questionnaires were distributed after the questionnaire was finalized. The target group of this survey was the students in higher education – Hong Kong university students.

Questionnaires were distributed during the lecture time, as this was the easiest way to reach a large amount of students in higher education at the same time. There were 200 questionnaires distributed and 153 questionnaires were returned. There were 153 out of 163 questionnaires fully completed. Effective response rate = Total number of complete questionnaires returned/ Total number of questionnaires distributed

= 153 / 200 x 100 %

= 76.5 %

Validity and reliability are the most important and fundamental characteristics of every survey procedure. Factor analysis and reliability analysis were conducted to ensure that the collected data was valid and reliable to carry out further investigation.

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Factor analysis is a multivariate analysis procedure. This procedure is trying to identify underlying "factors". The purpose of factor analysis is to reduce the variables involved to explain a relationship (Walker &Maddan, 2009). The minimum acceptable value of factor loading and corrected item-total correlation is 0.3 (Fornell & Larcker, 1981). In the other hand, the items with < 0.3 have to be deleted. As shown in Table 1, none of the item is less than 0.3, thus, all seven items were retained.

Alpha model is used to conduct reliability analysis for this study. Therefore, Cronbach's alpha is the coefficient used in the analysis. The minimum Cronbach's alpha has to be larger than 0.7 (Nunnally, 1978). On the other hand, the scale is treated as not reliable, if Cronbach's alpha is smaller than 0.7. As shown in Table 1, the Cronbach's alpha of variable "Attitude" is 0.874 and it is larger than 0.7, therefore this variable is considered as reliable.

RESULTS AND DISCUSSIONS

Finally 83 male students (54.2%) and 70 female students (45.8%) responded the questionnaire. The finding shows that there is no significant gender difference ($t = -0.439$, $p = 0.661$) of attitude towards e-learning in Hong Kong higher education. Hence, H1 is rejected.

Surprisingly, gender difference was found to have no relationship with attitude towards e-learning. The result was inconsistent with previous studies, therefore, H1 was rejected. A possible explanation is that e-learning has become very common in secondary school or even primary school. Computer is now a kind of daily necessaries, therefore, female and male no longer have different view on computer. As mentioned by Colley (2003), female and male used to be treating computer differently. However, the result showed that this statement is no longer valid for nowadays society.

CONCLUSIONS

It can be concluded that there is no significant gender difference of attitude towards e-learning in Hong Kong higher education. Since the target participants were students in higher education, the findings of this study contributed to those educators who are teaching in higher education.

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The limitations of this study are small sample size and uneven distribution of education level. If sufficient resource is provided, the sample size could be larger which the education level will be more evenly distributed.

For future study, qualitative analysis such as interview could be used to investigate why there was no gender difference of attitude towards e-learning.

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Implementation Of Multi Level Rewarding Strategy To Stimulate Students Independency

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Abstract
Inspired by multilevel marketing strategy, a strategy called multilevel rewarding is implemented in a learning process. This strategy is conducted by giving score to a student who help the others in doing assignment. When the assisted student also helps the others then both the first and second assistants obtain score. In this strategy, every student who gets assistance from the others has to mention the helpers in their assignment sheets. The score is also given to the assistant when an assisted student reaches the good result in exam. This strategy has been implemented to the Complex Function Class at Mathematics Department of Brawijaya University, Indonesia. At the end of the semester the lecturer recognizes the characteristics of the students. There are students who are not only independent, but also like to assist other students. On the other hand, there are also the independent students who never help another student. Moreover, some solitaire students, who never ask for help from others even though they could not do the assignment, are also recognized. The interesting result is that there are many students who become independent in the end of semester after assisted by another student in the early of semester.

Keywords: multilevel, reward, assignment, independency, student characteristic

INTRODUCTION

Complex Function I is a compulsory subjects offered to students in the 4th semester of Mathematics undergraduate program at Mathematics Department, Brawijaya University, Malang, East Java, Indonesia. As one of the core courses, Complex Functions I is introducing students to the set of complex numbers as an extension of the set of real numbers and its properties. In addition it is also introduced a variety of functions and transformations on the set of complex numbers with their properties. Many concepts taught in this course are applied to many other areas of science, especially physics and engineering. Therefore this subject absolutely needs lecturer's abilities to motivate students by explaining the role of mathematics in various fields of science outside of Mathematics. This course is a prerequisite for the Complex Functions II course which is also the core as well as compulsory subject. Hence, students have to master the material in this course in order to avoid difficulties when attending Complex Functions II courses. Optimal results from learning process might be achieved if the students understand the critical analysis concepts taught in class correctly. It required such an

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effort to support the learning process and stimulate student's learning spirit. In the even semester of 2014, there are three classes of Complex Function I, namely A, B, and C class. A strategy called multilevel rewarding is applied to the class B by using student worksheet. The objective of this strategy is creating a better learning atmosphere so that the material more easily to be understood, providing a better learning process, and enhancing the spirit of the students in the process of mastering the concept of analysis.

Generally, there are many part of materials in Complex Functions I subject which intersect with Calculus III course materials, especially when discussing concept of limit, continuity, and derivatives. The material which is different from Calculus III and becomes the typical materials of Complex Function I course is the discussion on the elementary functions and transformations in the complex plane, especially Mobius transformations. In addition, the representation of complex numbers in the exponential form is also interesting and its applications are often found in the field of electronics and physics. The concept of analyticity of a function learned in this course is required in order to understand well the material in Complex Functions II course related to integral and series concept. Some textbooks which can be referred in order to master all materials studied in subjects Function Complex I and II are Saff and Snider (1993), Churchill (2009), Poliouras (1990), and Wunsch (1994).

To solve a mathematical problem, there are several procedures that must be passed, namely gathering information related to the problems, knowing what is being asked and the objectives to be achieved, sorting out, among the available information, which information is really useful, determination concepts will be used to address the problem, applying the elected concept, error identification, indicating if the final destination has been reached, trying different ways to solve the problem, and finding better ways to solve problems. Problem solving activity in mathematics can hone the process of thinking in solving the problem, which includes the ability to think logically, critically, creatively, and strategically. By having knowledge about the role of mathematics in the thought process in general, it is expected that students will be encouraged to learn mathematics material. The ability of the thought process is very useful in life to face some problems, whether the problem is related to the development of science or problems encountered in everyday life. Therefore, maximum effort is needed in order to obtain satisfactory results, both for the students themselves as well as for lecturers and educational institutions.

IMPLEMENTATION OF LEARNING STRATEGY

Teaching process during Complex Function I class consists of the following three stages.

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1. Learning in class

At the first meeting lecturer explains the role of Complex Functions I material in the process of thinking and scientific problem solving. Furthermore, at the beginning of each subject, lecturer presents briefly the importance of the material that will be taught. At the end of each explanation of a concept, the lecturer gives examples of concept application, followed by exercises solving guided by the lecturer.

2. Self-learning

At this stage, the students were given the task to carry out independent learning by applying multilevel rewarding strategy in the following manner. After a subject is delivered completely, lecturer gives Student Worksheet (SW), consists of several questions to evaluate the students understanding to the concept. At the end of each question, students have to mention how they obtain the answer of the questions, whether they done independently or under an assistance. If students choose the option 'with the assistance' then they are asked to write the name of another student who helped them. Students who assist other students in the process of self-learning are notified as up liners, while students who receive assistance are notified as down liners. If a down liner achieves a good point, then the appreciation is given to her / his up liner, in the form of addition on assignment, quiz, or test scores, depending on where the concepts were evaluated. By applying this method, students who are having trouble in understanding the material in class will be helped by another student. In addition, it can be monitored students who have or have not been able to learn independently as well as their development.

3. Assessment

Some assessment to measure the level of students' understanding of the material are held. It consists of 2 quizzes and 2 exams, namely middle and final exam. Each quiz measures student mastery of the material in three previous meetings, while every exam measures student mastery of the material seven previous meetings. The determination of the final score is done by considering the presence and activity of students in the lecture with a weight of 10%, WS score with a weight of 10%, the quiz average score with weights of 10%, the middle exam score with weight of 35%, and the final exam score with a weighting of 35%.

FINDINGS

The multilevel rewarding strategy is implemented to a learning process involving 40 students as participants of Complex Functions I course. Evaluation of the learning process is done by observing the level of activity of the students during the lectures, especially by looking at the average of the student attendance and activity of the student in raising some

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questions or solving some problems in front of class. It is noted that the average student attendance rate was very high at more than 96%. In addition, if offered to work on a problem in front of the class, there are always students who want to show their abilities without designated first.

Evaluation of the implementation of the multilevel rewarding strategy is done by observing the activity of students in doing tasks assigned and observe how the students do the task, whether independently or with the help of other students. During the semester there are 5 WS are given. Table 1 shows the data observed from 40 students about the way they do the assignments. In table 1, letter I stands for Independent, represents students who work the assignment independently. IU stands for Independent-Up line, represents students who work independently but they like to assist other students who needs their help. D stands for Down line, represents students who are helped by other students. DU stands for Down line – Up line, represents students who act as down liners but they like to help the others. COL means students who collaborate with other students when doing assignments. In Table 1 we can read that student with registration number 125090400111004 collaborates with student with registration number 125090400111022 when doing the first assignment. NA stands for Not Available marks students who do not submit the assignment. There is only one student who has ever absent in submitting one assignment, namely student with registration number 125090400111038. By observing the independence of the students in doing the task, based on Table 1, it can be found there were approximately 25% (11 people) 'friendly' students, marked by rows with grey shading in Table 1. They often or even stay on task independently and willing to share, marked by IU (Independent and became Up liner) or when acting as down liner they also became up liner, marked by DU (Down liner – Up liner). These 11 students can be considered as the potential resources when the Complex Function II course in the next semester applied Multi-Level Learning strategy.

Conversely, there were also nearly 30% (13 students) of population who are 'solitary' or 'loner', marked with an asterisk sign * in the last column of Table 1. They are often doing tasks independently but they neither like to share nor refer to other student, indicated by I (Independent). In addition, these 13 students are also never be an intermediary (DU). The good news is that there are only two students who have never done the assignment independently, which is marked with # in the last column of Table 1.

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Table 1. Data of students' activities in doing assignment

NO	REG. NUMBER	Assignment					Activities					
		A1	A2	A3	A4	A5	I	IU	DU	D	NA	
1	125090400111002	IU	I	D	D	D	1	1	0	3	0	
2	125090400111004	COL	IU	IU	I	IU	1	3	0	0	0	
3	125090400111008	I	D	D	D	I	2	0	0	3	0	*
4	125090400111010	I	D	D	I	I	3	0	0	2	0	*
5	125090400111012	DU	D	D	IU	I	1	1	1	2	0	
6	125090400111014	IU	D	I	I	I	3	1	0	1	0	
7	125090400111016	DU	IU	D	DU	I	1	1	2	1	0	
8	125090400111018	DU	D	D	I	I	2	0	1	2	0	
9	125090400111019	D	I	I	D	I	3	0	0	2	0	*
10	125090400111020	DU	I	IU	IU	I	2	2	1	0	0	
11	125090400111022	COL	D	I	DU	IU	1	1	1	1	0	
12	125090400111024	IU	I	IU	DU	IU	1	3	1	0	0	
13	125090400111026	D	D	I	D	D	1	0	0	4	0	*
14	125090400111028	DU	DU	DU	DU	D	0	0	4	1	0	#
15	125090400111030	D	I	D	I	D	2	0	0	3	0	*
16	125090400111032	IU	DU	D	I	D	1	1	1	2	0	
17	125090400111034	DU	D	D	D	D	0	0	1	4	0	#
18	125090400111036	D	I	I	I	I	4	0	0	1	0	*
19	125090400111038	D	NA	I	D	I	2	0	0	2	1	*
20	125090400111040	D	IU	IU	IU	IU	0	4	0	1	0	
21	125090400111042	D	D	DU	D	I	1	0	1	3	0	
22	125090400111044	IU	I	I	IU	I	3	2	0	0	0	
23	125090401111001	IU	I	IU	I	I	3	2	0	0	0	
24	125090401111002	D	D	D	D	I	1	0	0	4	0	*
25	125090401111004	D	I	I	I	D	3	0	0	2	0	*
26	125090401111006	DU	DU	D	IU	D	0	1	2	2	0	
27	125090401111008	I	D	I	I	I	4	0	0	1	0	*
28	125090401111010	D	D	DU	I	I	2	0	1	2	0	
29	125090401111014	IU	I	I	DU	I	3	1	1	0	0	
30	125090401111016	DU	D	D	I	D	1	0	1	3	0	
31	125090402111002	D	D	I	I	I	3	0	0	2	0	*
32	125090407111002	D	D	D	DU	I	1	0	1	3	0	
33	125090407111004	DU	DU	D	DU	I	1	0	3	1	0	
34	125090407111006	DU	I	IU	I	D	2	1	1	1	0	
35	125090407111007	I	D	D	I	D	2	0	0	3	0	*
36	125090407111008	DU	I	D	D	D	1	0	1	3	0	
37	125090407111010	IU	I	I	D	DU	2	1	1	1	0	
38	125090407111012	D	D	DU	I	DU	1	0	2	2	0	
39	125090407111014	D	I	I	D	I	3	0	0	2	0	*
40	125090407111016	D	IU	DU	D	D	0	1	1	3	0	

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Table 2. Recapitulation of students' activities when doing the assignment

Assignment / Action	Students Number				
	Assignment 1	Assignment 2	Assignment 3	Assignment 4	Assignment 5
Independent (I)	4	14	13	16	21
Independent & Up liners (IU)	8	4	6	5	4
Down liners (D)	15	17	16	12	13
Down liners & Up liners (DU)	11	4	5	7	2
Collaborating (COLL)	2	0	0	0	0
Not submitting (NA)	0	1	0	0	0
Total	40	40	40	40	40

Table 2 summaries the progress of student's performance from the first assignment up to the last assignment. Based on Table 2, it is observed an encouraging results. We can see that the number of students who do the assignments independently from the first task to the fifth task show an upward trend. In addition to observing how the students do the work, the performance of this strategy can also be seen from the scores obtained by the students, presented in Table 3. It can be seen that the average scores obtained in evaluations conducted by lecturers, such as Quiz, Middle Exam, and Final Exam are satisfactory, namely more than 70, which is equivalent to the mark B. When they are combined with the score of attendance, assignments, and the class activity we obtained 80.35 as the final average score, which equivalent to the mark A.

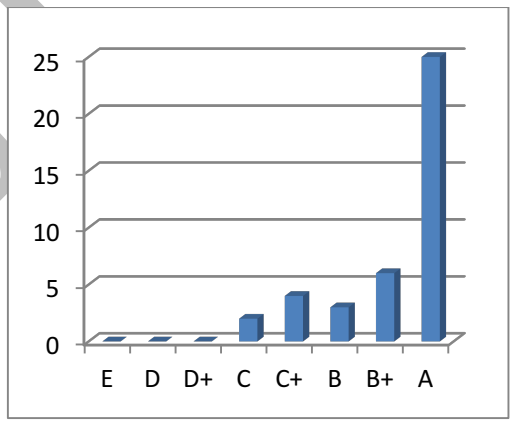


Figure 1. Score frequency distribution histogram

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It can be seen in the Table 3 and the histogram of frequency distribution of scores in Figure 1 that there are 62.5% students obtain grades A, only 5% of students who received grades C, and no students who fails. It can be said that the majority of students who taking this course pass successfully, and only 15% students who obtain intermediate score (C and C +).

It should be noted that the score of this course cannot be compared to the last year course since the lecturer has never taught this course before. However, the performance of the lecturer of this course can also be seen by observing the results of questionnaires from students.

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Table 3. Data of Complex Function I students' score

NO	Reg. Number	Presence	Assignment	Quiz	Class Activity	Mid Exam	Final Exam	Final Score	Mark
1	125090400111002	93.75	90.00	65.00	91.43	66.25	96.25	83.64	A
2	125090400111004	100.00	91.00	80.42	92.43	87.50	92.50	90.48	A
3	125090400111008	100.00	91.50	85.00	96	82.50	82.50	87.65	A
4	125090400111010	100.00	84.50	84.17	91	67.50	75.00	80.04	A
5	125090400111012	100.00	90.00	70.83	67.43	86.25	80.00	83.39	A
6	125090400111014	87.50	92.50	82.50	80.93	85.00	77.50	84.22	A
7	125090400111016	93.75	91.50	95.00	96	85.00	68.75	85.21	A
8	125090400111018	100.00	91.00	85.83	87.43	88.75	82.50	88.34	A
9	125090400111019	100.00	83.50	76.67	90.43	78.75	50.00	75.60	B+
10	125090400111020	100.00	93.00	91.25	93.93	90.00	100.00	94.62	A
11	125090400111022	100.00	86.00	93.33	96	82.50	87.50	88.63	A
12	125090400111024	100.00	87.50	95.00	91	90.00	55.00	82.35	A
13	125090400111026	100.00	89.00	71.67	58.43	62.50	47.50	68.31	C+
14	125090400111028	100.00	91.75	85.00	89.93	88.75	82.50	88.66	A
15	125090400111030	81.25	94.25	82.08	89.93	71.25	83.75	82.93	A
16	125090400111032	100.00	93.75	92.92	93.5	70.00	80.00	84.89	A
17	125090400111034	100.00	87.25	70.42	93.5	61.25	83.75	80.09	A
18	125090400111036	100.00	89.50	72.08	92.43	52.50	60.00	72.48	B
19	125090400111038	75.00	70.50	58.33	67.43	61.25	50.00	61.99	C+
20	125090400111040	100.00	90.00	91.25	93.93	90.00	82.50	89.64	A
21	125090400111042	87.50	75.75	64.17	76.68	81.25	53.75	71.73	B
22	125090400111044	93.75	88.50	92.92	92.43	92.50	60.00	83.73	A
23	125090401111001	87.50	95.25	92.50	95	93.75	95.00	93.74	A
24	125090401111002	93.75	85.00	43.75	40.43	70.00	25.00	58.54	C
25	125090401111004	100.00	90.75	75.00	92.43	77.50	95.00	88.02	A
26	125090401111006	100.00	91.25	93.75	95	82.50	95.00	91.50	A
27	125090401111008	93.75	90.00	82.50	96	68.75	45.00	73.66	B
28	125090401111010	93.75	88.50	67.50	78.43	80.00	61.25	76.98	B+
29	125090401111014	100.00	89.50	85.83	95	83.75	76.25	85.98	A
30	125090401111016	100.00	90.10	62.50	92.43	81.25	47.50	75.70	B+
31	125090402111002	100.00	89.75	80.42	93.93	68.75	80.00	82.57	A
32	125090407111002	100.00	83.25	60.42	96	41.25	57.50	66.98	C+
33	125090407111004	100.00	92.75	82.50	96	68.75	55.00	77.34	B+
34	125090407111006	100.00	91.50	92.50	95	76.25	76.25	85.18	A
35	125090407111007	100.00	84.75	67.08	79.68	41.25	27.50	58.81	C
36	125090407111008	100.00	90.25	85.83	89.93	82.50	70.00	83.75	A
37	125090407111010	100.00	93.50	70.00	96.5	86.25	93.75	90.35	A
38	125090407111012	93.75	83.50	85.83	91	73.75	55.00	75.95	B+
39	125090407111014	93.75	90.75	74.17	97.5	53.75	68.75	75.32	B+
40	125090407111016	81.25	86.75	69.17	61.68	37.50	67.50	64.81	C+
	Average	96.25	88.73	78.93	87.60	74.72	70.56	80.35	A

CONCLUSIONS

Based on some findings during the implementation of multilevel rewarding strategy to a mathematics course, some conclusions can be drawn. The application of the multilevel rewarding in Complex Function 1 class can be used to observe the learning styles of students, especially in their collaboration with other students. In this study, approximately 50% of the students do the work independently. It is observed that about 25% of students want to share with other students or become a reference for other students, and about 30% of students are

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loners, which does not share or not the reference another student. It is also observed that the trend of student independence increases from the first task up to the last task. The data of 'friendly' students are very useful when multilevel learning method will be implemented in the Complex Function II subject next semester. These students can be act as leaders in the study groups which are built. The results of assessment are encouraging, with an average of 80.3 students' final grades, the lowest letter grade C, and 85% of students obtained score of more than C +.

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Individual Factors That Encourage The Use Of Virtual Platforms Of Administrative Sciences Students: A Case Study

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Abstract

Higher education Institutions have incorporated into their educational processes the virtual learning platforms use, in their search to answers to the dynamic and changing needs of young students, thus students have practical training in the use of information technologies and communication (ICT) in their curses. However, few studies have been developed in developing countries to understand the motivating factors of the virtual learning platforms use of undergraduate students.

Based on this need, this research aims to examine the individual factors that encourage the virtual platforms use in university students from the city of Medellin, taking as a case study the population of undergraduate students of management sciences from the Universidad Autónoma Latinoamericana, the Institución Universitaria Escolme and the Instituto Tecnológico Metropolitano.

The proposed methodology is descriptive type through a quantitative methodological design, where a self-administered questionnaire was used as instrument and applied to 270 university students from the city of Medellin. Between the main results it is observed although most of undergraduate students have used virtual learning platforms and have low frequency platforms use per week. In addition, it is noted that the factors who have influence in the positive attitude of respondents to the virtual learning platforms use are the innovative personnel, ability for self-learning, and self-efficacy and personal perception.

Keywords: University students, Attitude, virtual learning platforms, encouragement

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BACKGROUND

Abbad, Morris & Nahlik (2009) consider e-learning refers in general sense to any learning that is electronically activated. In a more specific sense, e-learning refers to that learning more focused and enabled by the digital technologies application. It becomes to any learning that is based on the Web. In other words, e-learning is a distance education, where students learn

through the Internet, without face to face contact with their teachers, who are usually in a different location (Teo, 2010).

E-learning is considered as an alternative to learning, is becoming as widespread method in higher education institutions worldwide, according Garrison and Anderson (2003, cited by Persico, Manca, & Pozzi, 2014), in many cases, the aim is to determine a profound change in the way which teaching and learning take place in universities. The e-learning has taken into account in educational centers in recent years, considered as a new paradigm in modern educational methods, which changes the behavior of individuals in function of technological advances of the 21st century (Calli, Balcikanli, Calli, Cebeci & Seymen, 2013).

In this sense, in recent decades universities have gained much experience in the application of Information and Communication Technologies (ICT) in education management. However, Lu (2012) suggests that the adoption of e-learning remains relatively new to many universities and therefore these are faced to new challenges in e-learning management systems building, complicating their integration into existing information systems in the campus.

For Teo (2011) e-learning is one of the most productive pedagogies in modern educational practice, with great potential to obtain impact on teaching and learning, which is limited by the physical location and various social needs, and other aspects. In many developing countries, where universities are concentrated in major cities, those interested in professionally training have difficulties to accessing on-campus education, where have direct contact with teachers and have the appropriate learning materials, due to the impossibility to commute to urban centers, which makes the availability of learning resources limited to the town where they are. Then, the e-learning appears as an alternative to increase the coverage of education. E-learning allows students located in a secluded or inaccessible places learning from instructors who are elsewhere, overcoming the physical limits and in many cases, the lack of time. Thus, e-learning has the potential to provide equity in access to higher education.

According to Bouhnik and Marcus (2006; cited by Calli, et al., 2013), the four fundamental benefits of e-learning are: the freedom to decide when to take each lesson online, the decreasing dependence on the availability of teacher's time; the freedom to express thoughts and ask questions without limitations, and the accessibility to online course materials whose effectiveness will be largely determined by the student. Furthermore, they add to the four

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above benefits, other proposed by Capper (2001) specifically for education, such as the advantages in terms of time, place, interaction, collaboration and modern teaching methods. Also, it supported by Liaw and Huang (2007), who emphasize three important elements to consider when the e-learning environment is developed: environmental characteristics, collaborative activities (learning), and the characteristics of the students.

On the other hand, e-learning has as disadvantage the complexity of its implementation, because the availability of a technological infrastructure is not sufficient to determine the uptake with new approaches, whether in the case of teachers or students, and even online universities, which have no experience in the tradition of on-campus teaching. Innovative methods often fail to be adopted because of various reasons such as the university staff that should be trained not only in the use of technology, but also in new methods of online collaboration, in other words, teaching tools in accordance to this type of teaching, and the organization of the university must be suitable for the purpose, including student expectations and learning habits can explain the success or failure of online learning environments (Piskurich, 2003; cited by Persico, Manca & Pozzi, 2014).

Precisely considering the disadvantages that entailed to the risk of failure in the implementation of an e-learning environment, a number of research articles have been developed, some of them approach the subject from the study of critical success factors of e-learning. To identifying some of these critical factors Selim (2007) found a variety of different authors' contributions, for example found that Papp (2000) explores distance education from a macro perspective and suggests some critical success factors that can help universities and teachers in developing e-learning environments, which include intellectual property, the suitability of the course for the e-learning environment, the construction of the course, the course content, the technological infrastructure, where the bandwidth, hardware reliability, network security and accessibility, and how to measure the success of the course are critical variables, which Benigno and Trentin (2000; cited by Selim, 2007) propose to focus on two aspects, the first assesses the learning, and the second evaluates the performance of students. In this case, factors such as the characteristics of the student, the student-student interaction, the effective support of tutors or facilitators, the quality of learning materials, and the learning environment and information technology used are considered.

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Another critical success factor (hereinafter CSF) is the student commitment in learning models, even with the possibility of communication in real time, anytime and anywhere, students must be motivated and committed, because in courses based on e-learning, students take responsibility for their learning speed (Selim, 2007).

In the same field of technological aspects, Volery and Señor (2000) identify three critical factors in e-learning: the technology, considering the ease of access and navigation, interface design and the level of interaction; the teacher attitudes toward students, their technical competence and the teacher interaction in the virtual classroom; and the previous use of technology from the student perspective.

In the same way, Soong Chan, Chua and Loh (2001) through a multiple case studies, verify that the critical aspects of e-learning are: human factors such as the technical competence, the mentality of e-learning and level of collaboration of the instructors and students, and the perception of information and technology infrastructure. Therefore, they recommend that all these factors should comprehensively be considered by the adopters of e-learning. Govindasamy (2002) in his research discussed seven parameters of e-learning quality: the institutional support, development of courses, teaching and learning, course structure, student support, teachers support, and evaluation. At same year Helmi (2002) concluded that information technology, market demand, and schools and universities are the motivating forces of e-learning.

Additional to the e-learning description concept, advantages, disadvantages and critical success factors, Ong & Lai (2006) consider that gender differences also play an important role in e-learning, despite is a relatively new technology. Then, it suggested that gender differences in e-learning have to be examined.

METHODOLOGY

For this article was conducted a descriptive field research based on a quantitative methodological design, which involved in the application of a self-administered questionnaire to 250 undergraduate students of management sciences at Universidad Autónoma Latinoamericana, the Institución Universitaria Escolme and the Instituto Tecnológico Metropolitano, where students were selected through a non-probability sampling criterion.

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Students should be undergraduate enrolled students for the 2014-02 semester. The questionnaire included dichotomous questions and Likert scale questions in a level 5th (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) designed to measure each of the constructs and factors specified in the proposed model (see Figure 1).

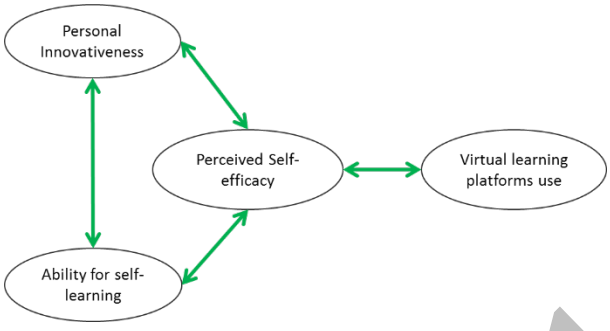


Figure 7 Proposed model.

This model searches for exploring the relationship between personal innovativeness factors, the ability for self-learning and self-efficacy and personal perception of surveyed students. It is important emphasizing the factors discussed in the proposed model are not directly observable constructs, so many questions were developed and compiled to identify each evaluated constructs.

ANALYSIS OF RESULTS

Initially, there are a predominance of women in surveyed students (54.4%) compared to men (43.6%). Likewise, it is important to note that the highest percentage of respondents is in a range of age over 26 years (48.4%), because most of the institutions surveyed are focused on people immersed in work context.

On the other hand, a related characterization was performed with the enjoyment of taking fully virtual curses Vs frequency of weekly use of e-learning tool available in each institution. The results are shown in Table 1.

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Table 1 - Frequency of use vs Virtual Courses

	Frequency of use				
Liking for virtual courses	**More than 6 times a week**	**5 to 6 times per week**	**Never**	**DK/NA (Don't know / No answer)**	**Total**
Yes	38,0%	10,0%	7,6%	0,0%	55,6%
No	23,2%	6,8%	8,0%	1,6%	39,6%
Total	61,2%	16,8%	15,6%	1,6%	95,2%

Source: compiled from data collected in the survey applied

First, it is observed about 56% of students express an enjoyment for fully virtual courses, compared to 40% do not. It is important to note that the percentage of this and other analyzes do not reach 100%, since all questions were not answered in the survey.

On the other hand, it is identified that there is a tendency for students to enter the platform more than 6 times per week, 61% said this alternative, compared with 31% who makes 5-6 times or not. In this regard, it is important to identify the participating institutions of measurement and strategies to increase levels of use of e-learning platforms.

For purposes of this research, personal innovativeness factors, ability to learn independently and self-efficacy and personal perception are taken into account to assess student motivation over the virtual platforms use. Below is presented an analysis carried out for each one of them (Table 2).

Table 2. Personal innovativeness factors

	Strongly agree	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I like learning about new information and communication technologies (ICTs)	40,0%	43,2%	11,2%	2,8%	1,2%
I believe between my classmates, I am of the first to try new technological tools	19,2%	29,2%	31,2%	12,4%	2,4%

Source: compiled from data collected in the survey applied

This factor is oriented to assess students' attitudes toward the new technologies use by their own choice. For the case study of this paper, through two questions of self-administered questionnaire to students were evaluated. First, the enjoyment to know new information and communications technology was researched, where it is observed that about 83% are agree

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and strongly agree that this reflects their attitude. This result is important and very relevant to determine the use of learning platforms while these are based precisely on the new ICT.

Furthermore, students were asked if they were the first to try the new technology tools versus their classmates, and in this scenario the acceptance rate is not highlighted, only 48% expressed identification with this aspect. These two elements show an interesting contrast, while they manifest enjoyment for new information and communication technologies, and there is no evidence of interest in being the first to use these new technologies more than their peers.

Table 3 shows the results for self-learning factor. This factor becomes important to establishing incentives of virtual platforms use, being one of the key success factors identified in the literature to ensure a proper implementation of these platforms.

Table 3. Self-learning factor

	Strongly agree	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I think using the virtual platform in subjects, improve my abilities to learning	18,0%	46,4%	20,0%	9,6%	3,2%
I like to be independent in my learning speed.	31,2%	46,4%	14,0%	5,6%	1,6%

Source: compiled from data collected in the survey applied

In this regard, it is important to emphasize the two results that can be seen. About 77% of students are agree and strongly agree with the enjoyment to have an autonomous speed in their learning processes. However, only 64% of students express that the use of these platforms improve their abilities on learning. These two elements become interesting, because the participant institutions of the measurement have a self-learning characteristics in their learning students' processes, but they do not show a direct improvement in their subjects supported on platforms, making it a challenge for universities in the sense of designing strategies for their students that actually they perceive as a contribution in their learning processes.

Finally, the factor of self-efficacy was assessed, and it was found more stable results in the questions associated. Table 4 shows the 75% of surveyed students are agree and strongly agree with having the appropriate tools to improve their learning processes with the help of

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the virtual platform. This result is interesting if is compared with the showed results in Table 3 related to the perception of improvement of learning abilities with the use of these platforms, since they recognize their abilities to improve their educational processes, but not yet identify that improvement. This comparison confirms the challenge that higher education institutions surveyed have, while their students confirm that they have the required abilities, but not evidence an improvement in their learning abilities. In the same vein, it is interesting that these institutions implement strategies to get the best benefit from the abilities that students report having to use the university virtual platforms.

Table 4. Perceived Self-efficacy

	Strongly agree	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
I have the appropriate abilities to improve my learning using the virtual platform.	21,2%	54,0%	16,8%	3,6%	2,4%
I have the required knowledge to use virtual learning tools available on the virtual platform.	26,0%	47,6%	13,2%	8,4%	2,4%

Source: compiled from data collected in the survey applied

On the other hand, it is observed that about 73% of students confirm that they have the required abilities to using virtual platforms. This result could not be more explained above. Not only they have the abilities but they have required knowledge to using these platforms. In this sense, the future outlook for the participating institutions is very positive and has numerous possibilities to encourage and increase the use and success results in the use of virtual platforms in their students.

ANALYSIS OF RESULTS OF PROPOSED MODEL

At first, the Cronbach's alpha was applied, which evaluates how the questions and constructs are related (Oviedo & Campo-Arias, 2005). This value should be close to or higher than 0.7 in order to generate a high reliability of the measurements of constructs. In this case, the alpha values swing between 0.710 and 0.806 (average 0.754), so it is considered an appropriated indicator (Table 5).

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Table 5. Reliability indices of the scale applied.

Factor	Alpha
Personal Innovativeness	0,746
Ability for self-learning	0,710
Perceived Self-efficacy	0,806

Source: compiled from data collected in the survey applied

To quantify the existed relation between model's variables, Cramer's V coefficient was used (Seo & Gordish-Dressman, 2007) because this allows concluding about the statistical independency of the variables in an independent way of the number of categories of the analyzed variables. Table 6 shows a consolidated of interdependence between the proposed model's factors using Cramer's V coefficient.

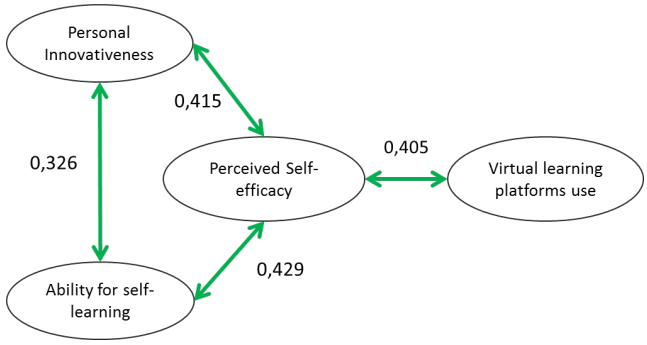
Table 6. Cramer's Coefficient – Correlation

Cramer's Coefficient – Correlation				
	Personal Innovativeness	Ability for self-learning	Perceived Self-efficacy	Virtual learning platforms use
Personal Innovativeness	1,0	0,326	0,415	--
Ability for self-learning	0,326	1,0	0,429	---
Perceived Self-efficacy	0,415	0,429	1,0	0,405
Virtual learning platforms use	--	---	0,405	1,0

Source: compiled from data collected in the survey applied

Table 6 shows that there is a strong relation between "ability for self-learning" and "perceived self-efficacy" (0,429), between "personal innovativeness" and "perceived self-efficacy" (0.369) and an average relation between "ability for self-learning" and "personal innovativeness" (0.326). The relation of the total sample of surveyed students toward the proposed model in the methodology can be visible in the figure 2.

Figure 2. Proposed model results.



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The results corroborate the point made by Agarwal and Prasad (1998) about the influence of personal innovativeness in the use of information technology. Moreover, it is confirmed the statement by Lu, Yao and Yu (2005, p. 245), who argue that "Behavioral sciences and individual psychology, however, suggest that social influences and personal traits such as individual innovativeness are potentially important determinants of adoption as well, and may be a more important element in potential adopters' decisions". The issue raised by Swingle and Vieta (2012) is also confirmed. They state that self-efficacy is established as one of the factors behind the adoption of virtual learning technologies and the future academic success of students in virtual training programs. It becomes a future work to evaluate how these factors influence the academic success of students in virtual classes.

CONCLUSIONS

It is important to note that a low usage platforms by surveyed students of the participating institutions. This use is measured on the entry frequencies in virtual platform. In this regard different alternatives for encouraging user to entry at platforms should be established, so there is the possibility that various features and advantages offered can be explored and internalized better.

While it is note a marked tendency in students of these institutions toward the abilities and required knowledge to use virtual platform. A high recognition compared to support provide by these tools in the learning processes of users is not observed. To such an extent that, it is important that self-learning factor is stimulated, while it becomes one of the relevant factor for students to generate motivation on the use of virtual platforms.

It is observed though obtain results that the personal innovativeness presents important elements in students' motivation toward the virtual platform use, while show a high degree of affinity with the exploration of new information and communication technologies. However, it is important to note that there is no a strong tendency to be between the first students to explore these tools. Therefore, it is important obtain an environment which users feel strong motivation to interact with these platforms in the moment that are incorporated into the learning process and thus, increase its use and enhance the results that may occur.

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Influence Of Perceived Behavioral Control In Entrepreneurial Intentions Of Engineering Students

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Abstract

Entrepreneurial intentions are influenced by the perceived behavior control of individuals, which it refers to the perceived probability of an individual to accessing to the resources or the opportunity to carry out a successful behavior, in this case, the creation of a business. This research searches for examining the influence of perceived behavioral control in the entrepreneurial intentions of engineering students from the Facultad de Minas in the Universidad Nacional de Colombia-Medellín.

The proposed methodological design is exploratory-descriptive type. It was used as a technique of data collection a questionnaire applied to a sample of 289 university students from the Facultad de Minas in the Universidad Nacional de Colombia – Medellín.

The main results it is observed that most students surveyed think that starting a business requires good business opportunities in the market and a lot of financial means. Furthermore, they consider that an entrepreneur needs to have applied knowledge (know-how) to move from intention to action to create the business. Moreover, it is observed that students perceive the business creation is an action that depends on them in autonomously way and not on the characteristics of the context.

Keywords: Control beliefs, entrepreneurial intentions, perceptions, university students, perceived behavioral control

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BACKGROUND

The control about the perceive behavior is a factor that has been expressed in literature about entrepreneurship 40 years ago e.g. Borland (1974, cited by Alonso & Galve, 2008) set out that the principal attribute that an entrepreneur has, is the internal perceive control. The concept of perceive behavior control is defined as an self-evaluation that people make of their competences and abilities (Segal, Borgia, & Schoenfeld, 2005), this involves the identification of availability of resources (Carr & Sequeira, 2007) to realizing a particular behavior, where the term behavior is the result of an analysis process of cost and benefits associated to the

realization or not of a particular activity independent of its ease of implementation (Durán, Alzate, López, & Sabucedo, 2007). This self-evaluation is the result of a series of events experimented by the subject at the past, which affect his perception about the availability of resources and the existence of other perceived obstacles (Carr & Sequeira, 2007).

The perception of perceive behavior is one of the variables more included in theories about formation of enterprising intentions (Krueger & Brazeal, 1994; Krueger et al., 2000; Carr & Sequeira, 2007). This is important, because at the last years the entrepreneurship is highlighted worldwide as a fundamental tool to achieving an economic development on the regions (Brooks et. al., 2007). Although, it is not completely clear which are the factors that make people to take decisions to start a business. Thus, the enterprising behavior is associated to particular individual characteristics; also, to education and received training about the business creation process (Valencia, Cadavid, Echeverri, & Awad, 2012). Although, other authors defined the perceive control not as an self-evaluation, is more like a multiple factors operating on internal and external level (Durán et al., 2007), that encourage or obstruct the performance of behavior, and the perception of control that the individual has about those factors (Alonso & Galve, 2008). As a result, the individuals have the intentions of participating in those works which are possible to make successfully (Bandura, 1997).

To referring to this theme, some authors are used to use the term self-efficacy, which has reference to equal concepts (Boyd & Vozikis, 1994; Krueger et al., 2000; Sánchez, Lanero & Yurrebaso, 2005), in other words, the self-efficacy is the believe that an individual has, and to be trained to managing and executing actions to generating positive results (Bandura, 1997), and is related to the start and the perseverance on a particular behavior even under uncertainty conditions. Also, contributes in the establishing of high goals, to be more flexible, it helps to reduce threats, and decreases the sensation of impossibility and insufficiency (Krueger, 2008). Furthermore, the self-efficacy represents the believe of achieving successfully a goal by an individual (Carr & Sequeira, 2007). This is important, because the capability to recognize the opportunities on the environment, depends on the perceive behavior control (Krueger, Reilly, & Carsrud, 2000) and the self-efficacy in particular situation (Krueger, Reilly, & Carsrud, 2000). The self-efficacy affects the decision of acquiring a behavior and the quantity of effort made by the individual (Sánchez et al., 2005). Thus, after having defined the term, it is more clear that the self-efficacy is underlying on the most of realized activities by people (Carr & Sequeira, 2007).

Continue with the definition of the theme. It is fundamental characterizing individuals that perceive on themselves the internal control. They are people that have self-confidence, are more proactive and innovative, with a major aptitude to assume risk (Harper, 1998, cited by Alonso & Galve, 2008), and they consider that their actions control their destiny. The self-confidence in their individual abilities may cause a major success in enterprising level (Koellinger, Minniti & Schade, 2007).

It says that individuals have different options of behavior to choose, but to take that choice. They analyze how many control have about those behaviors (Krueger et al., 2000), and what will be the behavior that give more profits and usefulness, being conscious that exist some behaviors that involve big difficulties, and they will require a lot of compromise by the individuals, in this moment it's when the perceive behavior control of an individual has influence, because contributes directly with the perception of subject to being prepared or not to acquiring the behavior above (Segal et al., 2005).

However, the perception that a person has about control of his behavior may have influenced by the practice experience, by the possibility of learning by experts, by having examples to following, and by the domination of psychological and emotional side (Krueger et al., 2000). This happens because, the feelings' competition are affected by the social comparison, since is very usual that people judge their proper abilities compared with the others (Bandura, 1997).

When research or studies are conducted, which is expected to analyze and measure the perceived behavior control, a well-structured item has to be included, that allows to know the degree of confidence that people have in their proper ability to realize the behavior above (Durán, Alzate, López, & Sabucedo, 2007), and the extent to which a person perceives that controls their behavior is an excellent indicator of control that actually owns, which serves as predictor of future behaviors (Ajzen, 2002). Usually, it is possible to measure the behavioral control of an individual, calculating its annual earnings as self-efficiency is directly linked to entrepreneurial, personal and financial success (Sánchez et al., 2005).

METHODOLOGY

For the present research it was carried out a field descriptive research based on a quantitative methodological design, which consisted in the application of a self-administered questionnaire to 238 students of Engineering of Universidad Nacional de Colombia – Sede

Medellín, who were selected through a non-probability sampling criterion. The population would be undergraduate enrolled students at semester 2nd 2014.

The questionnaire has included dichotomous questions and Likert scale questions in a level 5 (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) oriented to measure each of the specified constructs and factors in the proposed model (see Figure 1).

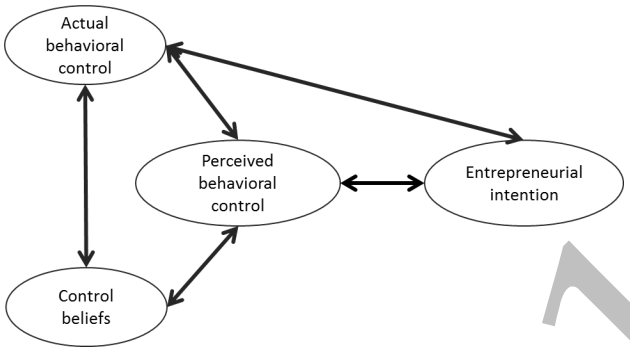


Fig. 8 Proposed model.

In this model, it searches for exploring the relationship between "actual behavioral control", "control beliefs" with "perceived behavioral control" and together with their influence on "entrepreneurial intention" of surveyed engineering students. Is important to stand out that the analyzed factors in the proposed model are unobservable constructs directly, so several questions was prepared and compiled with the aim of identifying each one of evaluated constructs.

Following this, the reliability of the questions and scales used in the measurement of each constructs is evaluated by the Cronbach's alpha and split-half. Then of verifying the reliability, the existed relationship between the model variables was quantified using Cramer's V coefficient to measure the relationship between the factors.

FINDINGS

Initially, each of the constructs was described, contextualized its meaning and explained its effects and the obtained results in this research work.

Control beliefs

Control beliefs are the first predictor of behavioral perceived control, and known as perceptions of internal factors (abilities of the individual) and external (opportunities, constraints) that may facilitate or inhibit the development of behavior (Chorlton et al., 2012).

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In entrepreneurship context, an appropriate definition would be "events that could facilitate or complicate the adoption of innovations" (Marcati et al., 2008).

Table1: Control beliefs on surveyed students' measurement.

Control beliefs	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	DK/NA
An entrepreneur needs to have applied knowledge (know-how)	43,25%	38,41%	10,03%	4,50%	1,73%	2,08%
The implementation of an enterprise requires a lot of financial resources.	23,96%	45,49%	21,88%	5,56%	1,04%	2,08%
Creating an enterprise requires good business opportunities in the market.	23,26%	50,69%	16,32%	2,43%	0,69%	6,60%

Source: compiled from data collected in the survey applied

Table 1 shows the valuation provided by the respondents to the "know-how" in entrepreneurs, emphasizing the necessity of combining practical and theoretical knowledge in their education. Also, they expressed the need of identifying a good business opportunity and having financial resources to create a business.

Perceived behavioral control

The perceived behavioral control refers to the result of the perceived probability of an individual of accessing to resources or the opportunity to accomplishing successfully a behavior (Pee, Woon & Kankanhalli, 2008). Ajzen (1991) defines as "a self-evaluation of an individual's own ability in relation to the task or behavior." Sondari (2014) interprets it as "the viability of the proposed behavior." Table 2 indicates the question results that measure this factor in the self-administered questionnaire applied.

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Table 2: Perceived behavioral control on surveyed students' measurement.

Perceived behavioral control	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	DK/NA
Entirely depends on me if I become an entrepreneur.	46,71%	31,49%	12,46%	5,54%	0,69%	3,11%
If I tried to start a new company, I would have a high probability of being successful.	10,42%	25,35%	43,75%	4,86%	2,43%	13,19%
I am ready and am able to create a new company.	8,33%	14,58%	34,72%	25,35%	8,33%	8,68%

Source: compiled from data collected in the survey applied

With the results presented in Table 2 is noted that students' decision making about creating a company is an autonomous decision, but they indicate that do not have confidence of the success probabilities they would have if they create a company neither feel they prepared to start a business.

Actual behavior control

The actual behavioral control refers to "the ability of individuals to change their behavior through their abilities, tools and resources" (Szakály, Szente, Kövér, Polereczki, & Szigeti, 2012). Also, it can refer to "the external factors that may be out from the immediate control of the individual, besides the intention, is likely that they have influence on the behavior" (Dunn, Mohr, Wilson, & Wittert, 2011). Furthermore, Ozkan & Kanat (2011) named as actual behavior control the availability of resources and opportunities required to make the specified behavior, denotes the actual behavior in the individuals' motivation to try the behavior. In table 3 is observed the questions results that measure this factor in the self-administered questionnaire applied.

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Table 3: Actual behavior control on surveyed students' measurement.

Actual behavior control	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	DK/NA
If I had the opportunity and resources, I would like to create my own company.	53,13%	35,42%	6,60%	2,78%	0,69%	1,39%

Source: compiled from data collected in the survey applied

Table 3 shows that students consider that they would like to create a business, if they had a favorable current outlook regarding the identification of a clear opportunity of entrepreneurship and the required resources to start a company from a business idea.

ANALYSIS OF RESULTS OF PROPOSED MODEL

At first, the reliability of the questions used to measure each of the constructs is verified, in order to inquire into the scale of the questions measure each aspect. For this, the Cronbach's alpha was applied, which evaluates how the questions and constructs are related (Oviedo & Campo-Arias, 2005). This value should be close to or higher than 0.7 in order to generate a high reliability of the measurements of constructs. In this case, the alpha values swing between 0.681 and 0.734 (average 0.711), so it is considered an appropriated indicator, considering that it measures unobservable aspects such as control beliefs and perceived behavioral control. Furthermore, it is analyzed the covariance between two halves of the whole sample (Split-half), which results are consistent with those produced in the Cronbach's alpha (Table 4).

Table 4: Reliability indices of the scale applied.

Factor	Alpha	Split-half
Control beliefs	0,715	0,727
Perceived behavioral control	0,681	0,692
Entrepreneurial intention	0,734	0,719

Source: compiled from data collected in the survey applied

In addition, to quantify the existed relation between model's variables, Cramer's V coefficient was used (Seo & Gordish-Dressman, 2007) because this allows concluding about the statistical independency of the variables in an independent way of the number of categories of the analyzed variables. In the field of study of social sciences the Cramer's V coefficient is interpreted as follows: low relation ($0.1 <$ Cramers' V ≤ 0.2), medium relation

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(0.2 < Cramers' V ≤ 0.3), and high relation (0.3 < Cramers' V ≤ 1.0) (Fierro, 2010). Table 5 shows a consolidated of interdependence between the proposed model's factors using Cramer's V coefficient.

Table 5: Cramer's Coefficient – Correlation

	Actual behavioral control	Control beliefs	Perceived behavioral control	Entrepreneurial intention
Actual behavioral control	1,0	0,262	0,489	0,421
Control beliefs	0,262	1,0	0,305	---
Perceived behavioral control	0,489	0,305	1,0	0,369
Entrepreneurial intention	0,421	---	0,369	1,0

Source: compiled from data collected in the survey applied

Table 5 shows that there is a strong relation between actual behavioral control factors and perceived behavioral control (0.489), between actual behavioral control and entrepreneurial intention (0.421), between perceived behavioral control and entrepreneurial intention (0.369) and an average relation between control beliefs and perceived behavioral control (0.305). The relation of the total sample of surveyed students toward the proposed model in the methodology can be visible in the figure 2.

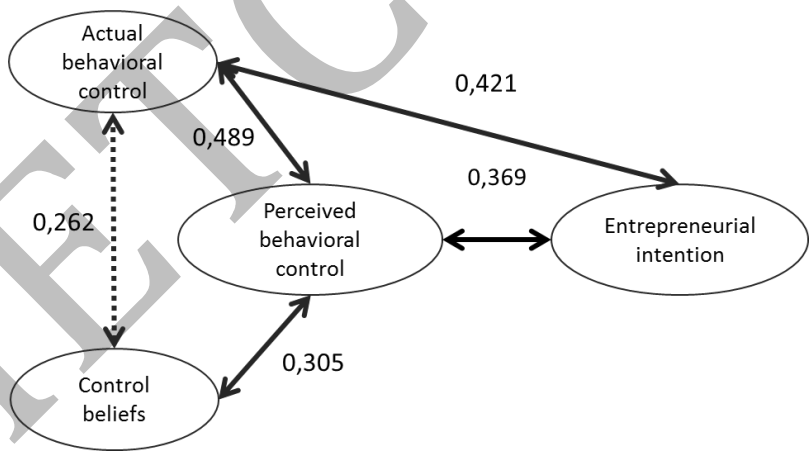


Fig. 2 Proposed model's results.

The relations presented in Figure 2 confirm the proposed by the Theory of Planned Behavior of Azjen (1991, 2001), which validate the relationship between these factors, then adding the component actual behavioral control to his Theory of Planned Behaviour (Ajzen, 2002).

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CONCLUSIONS

It is observed that the explanatory factors related with perceived behavioral control are not independent between them, but are correlated as it suggested by the model of the Theory of Planned Behaviour (TCP) of Azjen (1991). For the studied population the relation between these factors through Cramer's V coefficient proved to be high in all cases except between actual behavioral control.

The methodological approach used, allowed the verification of proposed model in the methodology, allowing to observe that the "availability of resources and opportunities required to create a business" (actual behavioral control) become the most significant model's factor to encourage entrepreneurial intention. Moreover, the importance of the actual behavioral control as external belief of the attitudinal factor "perceived behavioral control" due to the strong relation between these variables.

Most surveyed students perceived the creation of an enterprise as an autonomous decision that may be influenced by factors such as the availability of resources and business opportunities in the markets. However, they set out that the decision is conditioned to their desires of independency and autonomy. In this aspect, about 70% consider that are not ready or do not have the abilities to create a business, which affects the entrepreneurship and short term reflects a low intention on creating a company.

The proposed methodology and statistical analysis used do not allow establishing unidirectional causality between related factors with "perceived behavioral control" and entrepreneurial intention, neither between the factors. Consequently it is suggested as future works the search of methodological designs that allow establishing unidirectional causality between these factors.

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Intellectual Development Of Students During Training Chemistry And Mathematics

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Abstract
The article reflects the chemistry teaching characteristics of future competent specialists and bachelors of technical specialties and areas of training in Yurga Technological Institute, Tomsk Polytechnic University, which promotes the intellectual development of students. To ensure effective training of students for professional work with the development of their intellectual capacities student-centered learning and algorithmic approach to solving problems and learning environment Moodle is applied. Examples of the use of algorithms for solving chemical problems and tasks developed on the basis of services of Google are given. Methodical features of training tools aimed at developing students' intellectual capacity, and the possibility of their use in the educational process are considered. The results of a pilot study to determine the level of intellectual development of the students leads to the conclusion about the effectiveness of approaches to teaching chemistry.

INTRODUCTION

At present, radically changed the criteria for the effectiveness of learning in higher education: it is not only the professional knowledge and skills, but certain individual psychological personality traits that contribute to its successful socialization, further professional growth. Graduate must learn how to produce the necessary knowledge to lifelong find their place in it. Consequently, the results of the educational process in high school should not be a person with a certain set of knowledge and creative personality, capable of exhibiting cognitive activity, independence, self-owning methods, formation and improvement of personal qualities necessary for the successful practice of a profession. However (Kust, 2015), the situation in Russia is complicated by the fact that the low level of intellectual capacity does not allow students to prepare the future quality of the competent specialist. Development of intellectual capabilities of the students have independent value, not only during training at a technical college, but also during future careers in the industry. The demand for a high level of intellectual capacity of students from the perspective employer, ensure the quality of his professional activity.

The need to develop intellectual capacities of students in the educational environment of a technical college has increased because the qualitative characteristics of applicants has

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changed. The discrepancy between the results of schooling and practice teaching in higher education is so great that a technical college today are not able to prepare a competent expert. By analyzing data from a survey first year students of Yurga Technological Institute, Tomsk Polytechnic University, we found that more than 80% of respondents had never paid attention to the study of chemistry at the school, did not attend clubs and electives. Despite this, about 50% of respondents believe the chemistry science necessary for future professional activities.

In addition, the process of learning chemistry in non-chemical technical college is a difficult task, as students, not only insufficiently prepared to assimilate the chemistry, but also have a low level of intelligence. (Politsinsky, & Demenkova, 2015). In these circumstances, the role of the teacher, who, interacting with students, should not only teach them how to learn efficiently, but also learn to develop the intellectual abilities of each student, increases . More than 75% of the students have no idea how to develop intellectual abilities of the individual in the process of learning chemistry.

Thus, the development of students' intellectual capacities - this is the first task of qualitative training of future competent specialist in a technical college. At the same time, improving the training of chemistry is impossible without the organization of the whole process of the development of intellectual capacity that enables students to penetrate the nature of the materials, to gain experience mental activity and use this knowledge as a means to further development.

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THE STUDY

The aim of this study is to clarify the conditions conducive to the development of the intellectual capacity of students in learning chemistry. The study of the relationship of learning and development has always been one of the main problems of pedagogy. According to Chuprikova, "learning must be developing, ... including the development of the mental, moral and physical" (Chuprikova, 2007). Modern experts in the field of teaching methods emphasize that "... the study of chemistry should contribute to the intellectual development ..." (4, 2014). Under the intellectual development, we understand "the formation of the ability to master and use different types of thinking (empirical, imaginative, theoretical, concrete-historical, dialectical in their unity)" (Vishnyakov, 1999). A lot of ways to ensure the intellectual development of students are found in the pedagogy. These include problem-based learning, self-study, experiment, and others. The works of Landa the value of the algorithmic approach to learning as an important way to the intellectual development of students is

disclosed. This approach is particularly important for students with low levels of thinking, for those who do not know "... how to think". (Landa, 1966).

In our view, the main shortcomings of the low level of intellectual capacity of students in teaching chemistry at the technical college linked to a number of factors: a sharp reduction in the hours of study of discipline, especially in the technical areas of undergraduate training, lack of teaching materials with the use of modern educational technologies, weak connection with the practical occupational, etc. In this regard, significantly increased the value of developing intellectual capacities of students in technical colleges. Testing has shown that a significant proportion of students of Yurga Technological Institute of Tomsk Polytechnic University seeks to obtain a high level of intellectual capacity with simultaneous high-quality chemical preparation (89%). Students attributed the development of intelligent features to factors such as the successful career (23%) and research work (18%).

We believe that the chemistry as an academic discipline has specific features, development-oriented intellectual capacities of the individual. This is also due to a huge ideological role that chemistry plays in the knowledge of the laws of nature and society, in solving the pressing problems of our time. Therefore, we consider extremely important in the process of teaching chemistry to develop the intellectual capacity to disclose the role of chemistry in the modern society and its contribution to the solution of global problems of society, strengthening the environmental component of the chemical content and its practical orientation. Thus, we can say that learning chemistry – is education, promoting a high level of intellectual capacity of students to adapt effectively in society.

The process of intellectual development of students in teaching chemistry at the technical college is based on a student-centered approach based on the diagnosis of individual psychological characteristics of students, held in the beginning of the semester in order to:

- Taking into account these peculiarities of personality in the organization of the teacher training process;

- Determining the potential of the student with the subsequent organization of training, providing their intellectual development;

- Analysis of diagnostic results for subsequent recommendations on the development of technologies, methods, teaching-learning, providing both the formation of knowledge, skills, competencies, and development of intelligence and personality in general.

A major component of the process of chemistry learning is solving tasks. This kind of learning activities allows not only to understand and remember the basic laws and formulas, but also to form an idea of their characteristics and limits of use; develop the skills of using

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the general laws to address specific, practical issues, thereby forming a culture of scientific thinking. In our view, the in the teaching to solve chemical problems is necessary to use an algorithmic approach to solve the problem of intellectual development of students. We believe that an active, creative algorithmic activity in solving chemical problems will contribute to both efficiency and quality of the educational process and intellectual development of students. According to Luria, "the most active and deployed the process of thinking stands in solving text tasks" (Luria, 2006). The ability to solve tasks – is an important requirement for high school graduate, more determined and socio-economic transformations that characterize contemporary Russian society. Chemistry material as an academic discipline allows effectively shape the cognitive ability to solve experimental and calculated objectives.

To solve the problem of ensuring the intellectual development of students in the teaching, students were offered a set of algorithms for solving tasks, developed on all chemistry course subjects in a technical college. For example, to solve the task to determine the chemical formula according to its quantitative composition (chemical formula of the mineral output, knowing that the mass fractions of the components in its composition: sodium – 37.9; aluminum – 12.9; fluorine – 54.2%) used the following algorithm:

1) assume that the mass of an unknown substance is 100 g, while in the latter the selected hitch will contain 37.9 g of sodium, 12.9 g of alumina, 54.2 g of fluorine;

2) determine the amount of the substance in the appropriate array:

n (Na) = (37.9 g) / (23 g / mole) = 1.65 mole; n (Al) = (12.9 g) / (27 g / mole) = 0.48 mole;

n (F) = (54.2 g) / (19 g / mol) = 2.85g / mol;

3) Find the molar ratio of the components:

n (Na): (Al): *n* (F) = 1.65: 0.48: 2.85 = 3: 1: 6. Consequently, the desired formula Na_3AlF_6.

It was found that any challenge is the "intelligent combination" (Oleynikov & Muravyov, 2014) of more simple routine tasks. Therefore, an important skill for the student becomes the ability to "dissect" a complex task to isolate from it a set of simple situations, the solution of which will not cause him difficulty. Furthermore, when solving tasks general recommendations aimed at in-depth analysis of the solutions are used. Students are encouraged to reflect on the task, make a brief recording conditions, if necessary supplemented by a graphic diagram (Figure 1).

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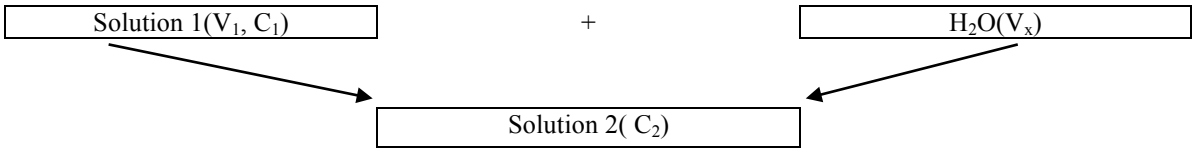


Figure 1. Example of a graphic scheme for solving the problem on "Ways of expressing concentration of solutions"

Next you need to determine whether to proceed with substances listed in the task, the chemical reaction and make the necessary reaction equations. In some cases, when the reaction products are mixed, the equations can be set up only after the analysis of the digital data. The derived equations are arranged coefficients; If the equation somewhat, they recommended numbered. The digital data to be processed by submitting the value in one dimension and interest for the convenience of calculations in a fraction of the transfer unit. If the task is a chemical conversion, it is more convenient to express the values of the masses and volumes in moles, counting them on a number of substances. Finished solve the task, check the correctness of the decision, estimating the answer from the standpoint of ordinary logic. For example, if the condition given volume in ml, and the answer turned out in tonnes, the decision is clearly wrong. Thus, in solving the problem may be to identify a number of steps which include:

- Meaningful reading of conditions;
- Analysis of data, identification of the required quantity, the establishment of relationships between variables;
- Defining solutions;
- The choice of calculation formulas;
- Performance computing; verification solution.

FINDINGS

For most students it is very difficult to solve settlement tasks in chemistry. If the school chemistry course not mastered the most simple tasks related to the key word "mole", then later at training in high school the student will not be able to decide consciously and more complex tasks. Analysis of the difficulties encountered by students in solving computational problems, showed that in the majority of cases (67%), the student can not understand the whole system of internal relations of task, establish its structure and plan solutions. Teaching students the use of an algorithmic approach that opening of the link between the structure of the task and how to resolve it should eliminate the usual difficulties and lead to choosing adequate solutions, the development of skills for independent work, the formation of the ability to think logically, to use methods of analysis and synthesis, to find the relationship

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between objects and phenomena. Table 1 lists common tasks, the solution of which develops basic mental operations.

Table 1: Examples of common tasks used for the development of mental operations.

Mental operations	An example of a typical task
Analysis	What mass of potassium chloride is required for the preparation of 0.2 dm^3 solution: a) with a mass fraction of 3% (r = 1,11 g \ cm^3); b) the molar concentration C (KCl) = 0,1111 moles \ dm^3?
Comparison	On the basis of the values of the standard electrode potentials of the copper and zinc to determine what type of metal is the anode, and which - is the cathode in copper-zinc galvanic cell?
Abstracting	Determine the color of phenolphthalein solution obtained by mixing 50 ml of solution C (KOH) = 0.10 mol / l and 50 ml solution C (KCl) = 0,15 mol / l.
Synthesis	Find the mass of the solute in the solution obtained by mixing 100 ml of solution C (NaCl) = 0,12 mol / L and 150 ml of a solution with ω (NaCl) = 14% (ρ = 1,04 g / cm^3).
Generalization	Select from a group of words concepts related to the subject "Fundamentals of chemical thermodynamics": the enthalpy, adsorption, entropy, anode, corrosion, dissociation.
Classification	Select substances belonging to one row and carry genetic transformation: ZnO, P, Ca $(OH)_2$, $CuCl_2$, P_2O_5, NH_3, H_3PO_4, As_2O_3, NaBr, K_3PO_4.
Categorization	Distribute to the classes of inorganic compounds of the following substances: HCl, $AgNO_3$, $(NH_4)_2SO_4$, KOH, $AlOHCl_2$.

Thus, we believe that the solution of tasks is an important part in the formation and development of intelligence, including technical intelligence, so necessary for technical college graduates.

An important tool for the development of intellectual capacities in teaching chemistry at the technical college is an electronic course on the subject that is located in an environment Moodle. Moodle - is a content management system specifically designed for creating online courses by teachers. The word «Moodle» - is an abbreviation of the words «Modular Object-Oriented Dynamic Learning Environment». This environment allows you to create a single educational space for students and teachers of the course. Using Moodle, the teacher can communicate with students, create and test tasks, publish text materials, and more. Moodle offers a wide range of opportunities to fully support the learning process in a remote environment - a variety of ways of presenting educational material, knowledge testing and monitoring performance, contributing to the intellectual development of students. The success of e-learning course based on Moodle facilitated by the fact that the student performs tasks in

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a free pace at a convenient time, not being bound by the training session. Specially selected system of tasks (for visualization, communication, and culture of mental labor, the system of games, workshops and task to work together on the basis of the services Google) contributes to the development and improvement of experimental skills, knowledge of the chemical, which develops intellectual abilities, expanding intellectual horizons of students on the basis of relationship science, technology and production. Availability and interactivity of electronic documents drive Google make them a convenient way to organize joint practical activity of students. Organization of the network platform for the group, or work together in several steps:

- A teacher thinks over a task that students will perform together, sharing in groups or collectively, define the tasks, the requirements for the results, and describes how to perform the evaluation criteria of the group and each member individually. Document Format Google (text, spreadsheet, drawing, or presentation) may be selected depending on the requirements for the results: a joint solution in the form of text can be written in a text document or presentation Google, the solution in the form of calculation tables and charts - in the form of Google Spreadsheet , designing simple circuits can be performed in Figure Google;

- The teacher creates a document template reference (text, spreadsheet, drawing, or presentation) Google, which clearly presents the task and students understand how and what they will do;

- It has access to editing, so students can make a copy and work in personal documents;

- Students also provide access to their document so the teacher might check it;

- The report is a reference to the author document.

The content and format of the document template is selected by author by teacher. For example, the task "Insert missing formulas in the reactions" can be issued in the form of a text document (text with gaps) or drawing (on it in the form of text blocks is located the main text and the formulas to be inserted). In the first case, the student missed enter the formula in the second - is dragging them with the mouse to the desired location. Specifying "Finish the sentence" - also a text document that has no end of the sentence. Students must complete them by writing phrases. Likewise, you can use tables Google. For example, offer to perform thermodynamic calculations using part common to all students of the original data (reaction equation) and part of variant (different temperatures of the process). Table with the original data in several different ways used by students as a template on which runs an individual or group assignment. Template "Presentations" is used as follows: to offer to supplement his presentation template slides, to develop the theme in different directions. Google services

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allow you to organize joint execution of tasks, for example: students are invited, working in groups, to develop a presentation at the conference "Chemistry in the mining industry." At the same time, each group puts in resources proposed by the teacher, the report on the problem and criticizes the reports of other groups. The teacher assesses both the reports and the review of pre-defined criteria. Of course, you can not entirely rely on such a way of assess of the individual contribution of each participant to the overall work. It is better to plan properly the distribution of functions (roles) in order to be able to evaluate the performance of each student. Format of tasks solutions in e-learning courses built with joint documents Google, it can be defined as "the answer - in the form of text" (if in addition to the product-document the teacher wants to receive an individual report or comments of students) or "The answer – out of site '(If you can evaluate the work of a joint activity).

The practice of using e-learning in demand at all stages of the development of intellectual capacities in teaching chemistry at a technical college, and features teaching aids used in the electronic course, are presented in Table 2.

Table 2: Methodical features of funds aimed at the development of intellectual capacity

Teaching tools	Methodical features of tools using
e-Course	Systematization of chemical material
Multimedia presentations	Study of new material. Activation of cognitive activity, removal of the intellectual barrier for speech report. Creation
Electronic books	Other sources of information. Independent work
Electronic textbooks	Independent work, individual assignments
Electronic test tasks	Control of chemical knowledge, skills, competencies and expertise. means of self-control
Tasks for joint activities	Contribute to organize the material on the chosen issue, the formation of communicative competence
Video lectures	Create a problematic situation, stimulate cognitive activity, broadens the outlook

Effective combination of developed principles, approaches, methods, tools intensified the process of development of intellectual capacity that showed the results of testing students.

The indicators of the intellectual development of students are the level of knowledge in chemistry, which can be assessed by the ability of students to apply their learning in a variety of situations, and levels of development of basic intellectual skills (analysis, synthesis, comparison, generalization) (Gil, 2010), which are investigated by means of tests (Sokolova, 2010).

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Testing of intellectual development was aimed at identifying the specific motives for learning, finding the level at which a student can handle abstract concepts and relationships between them, modulate various processes in his mind. In addition, we have identified a specific professional orientation of each of the student, the type of thinking and inclinations and abilities.

Table 3 shows the averaged data characterizing the quality and effectiveness of teaching chemistry of technical specialties students and areas of training.

Table 3: Dynamics of quality training criteria of students in chemistry

training criteria in chemistry	1term	2 term
The level of total effort, %	75	100
The level of quality effort, %	38	54
Students – Participants of competitions, conferences of various levels, %	12	36

The diagram shows the averaged results of the study of the general characteristics of intelligence (on R. Cattell), the definition of logical thinking, assessing the level of development of logical, figurative and spatial reasoning for students of technical specialties and areas of training.

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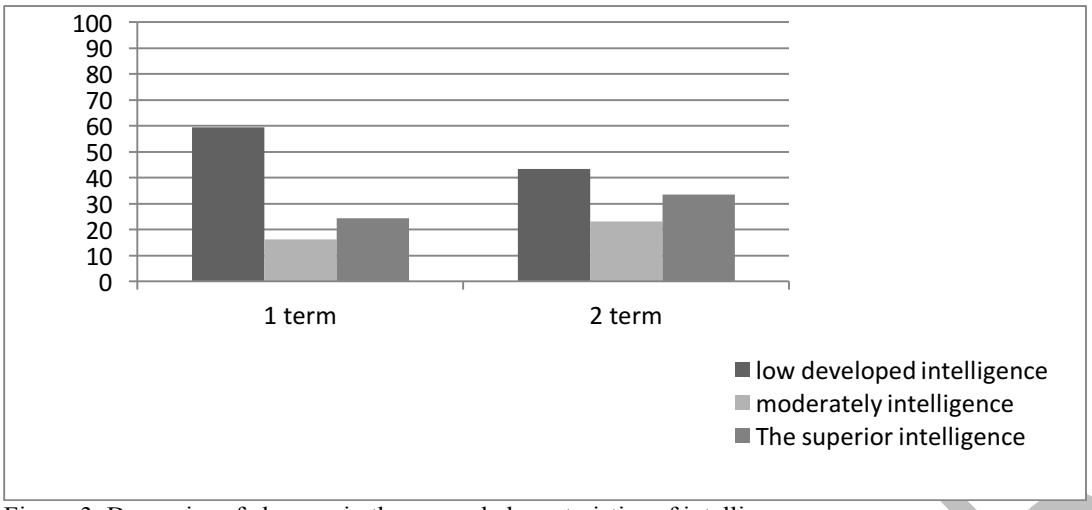


Figure 3. Dynamics of changes in the general characteristics of intelligence

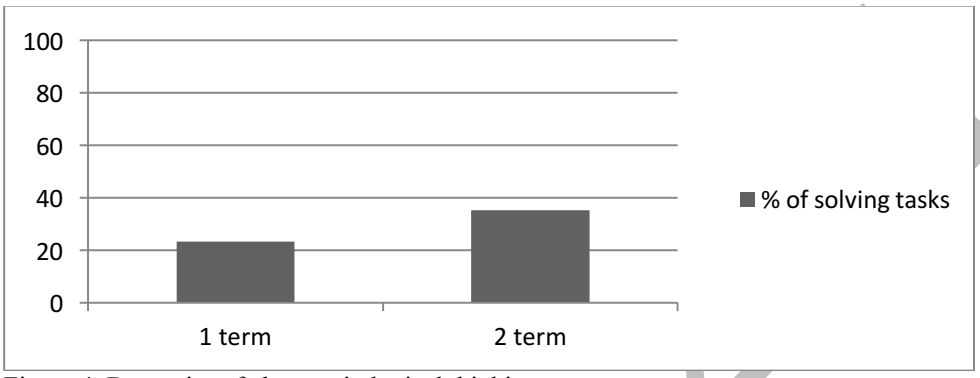


Figure 4. Dynamics of changes in logical thinking

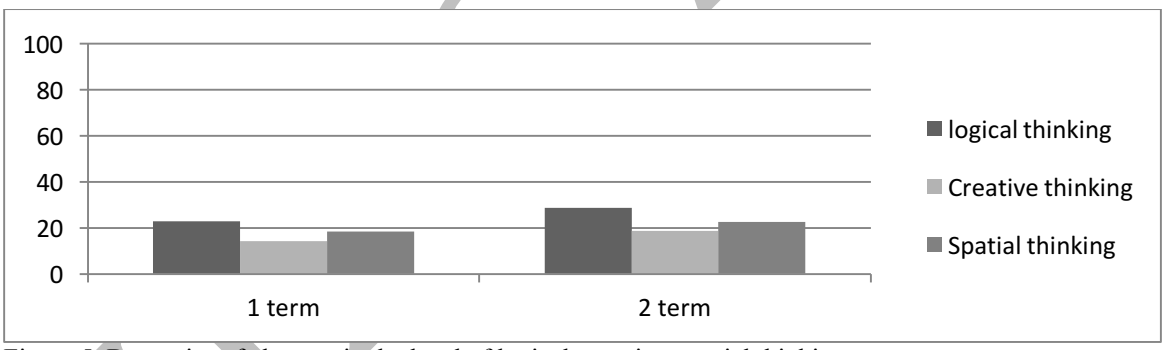


Figure 5. Dynamics of changes in the level of logical, creative, spatial thinking

Poll of future experts showed that more than half of students believe: through learning in environment Moodle it became easier to absorb training material, to learn how to plan their work with it. In the course of our survey of first year students of technical specialties and areas of training confirmed the fact that the majority of future professionals want to use the electronic environment Moodle learning and see it as a clear advantage (interesting, fascinating, comfortable, no time limits for assignments You can plan to work).

CONCLUSIONS

These results demonstrate the importance and effectiveness of the use of student-centered learning, algorithmic approach, as well as the organization of the students in an environment Moodle. Based on the above, with the purpose of the intellectual development of the individual student in the educational process, as well as improving the efficiency and quality of training of students of technical specialties and areas of training is offered:

- At the beginning of the first semester to diagnose individual psychological characteristics of the personality of students, including an assessment of their potential, creative abilities, personality and intellectual characteristics of students, with the aim of organizing the educational process, contributing to the intellectual development of the individual student;

- To study the dynamics of change in the level of intellectual development of students in order to adjust the educational process, application forms, methods and techniques of training, contributing to the intellectual development of the individual student;

- Actively and creatively apply algorithmic approach in addressing the cognitive, computational and experimental tasks to ensure the intellectual development of students;

- Revise objectives, content, structure, discipline "Chemistry" for students of technical specialties and areas of training;

- To prepare and implement a training complex for chemistry-based environment Moodle, which provides student-centered approach to learning, allows to organize training in joint solution of educational problems, to carry out the interchange of knowledge, expands the opportunities for in-depth study of the material, investigating the problem of self-search information. All these factors will contribute to the development of the intellectual capacities of students in learning chemistry.

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Knowledge Management And Technological Innovation Capabilities As Tools For Business Performance Evaluation

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Abstract
The constant changes in the characteristics of markets and accelerated methods for treating innovation processes have contributed to the search for strategies and management methodologies that enable organizations to be more competitive. One of these methodologies is the Knowledge Management (KM) that allows companies to manage and exchange knowledge from the place where it is generated to where it is to be exploited and assisting the needs of internal and external customers, from generation of organizational routines that facilitate creativity of individuals and innovation processes. For the generation of such processes, organizations must identify and make use of the resources and capabilities that are generating economic value, including knowledge, where a proper management of it allows a rapid response to market requirements and a reduction of the uncertainty associated with decision making related to the generation of innovation processes, such as development of new products and high quality services.

The proposed methodology consists of the review of the State of the literature about the relationship between the stages of knowledge management, the development of technological innovation capabilities and how it follows-up to organizational results. Therefore, the implementation of KM must be accompanied by a process of monitoring and control over business results in terms of innovation. In this way, management can adjust assertively business strategy to new environmental conditions, without putting at risk its stability and preserving the characteristics that generate competitive advantage for the organization.

Keywords: Knowledge Management, Technological Innovation Capabilities, Enterprise Results

INTRODUCTION

There are a few countries whose economies are growing up. They have been increasing concurrence between representative and traditional enterprises through the creation of competitive advantage. Therefore, it is necessary and fundamental to improve corporate strategies to reduce time and rework from improper information flow between different business sections. Those strategies should also avoid leakage and loss of knowledge from staff turnover in organizations.

In recent years one of the solutions that has become more important is to implement Knowledge Management methodologies. Those methodologies can preserve data,

information and knowledge within companies as relevant and vital actions for their correct performance and operation. Due to new market requirements, organizations need to identify and accumulate their technological innovation capabilities in order to promote the development of new products and services that help companies to achieve a competitive position in the market.

Moreover, there are some authors who have studied the causal relationships between some of the stages of knowledge management and technological innovation capabilities. However these relationships rarely have been investigated holistically because knowledge and innovation are managed separately in organizations. This separation is even more notorious when the competitive position of a particular industrial sector is analyzed. Also gaps are increasingly higher between large and small firms in terms of knowledge management application.

From the realization of this study, we tried to show the importance of identifying and promoting knowledge management phases within the organizational strategy, besides the importance of implementing knowledge management in the accumulation of technological innovation capabilities. For this, there will be a literature review about the concepts of knowledge management, resources, capabilities, technological innovation capabilities, in order to finally establish causality between these variables.

KNOWLEDGE MANAGEMENT

In the last two decades, knowledge management has become an important management tool and a source of competitive advantage for organizations, because of the emphasis it has in the appropriate management of intangible company`s resource: human beings and their inherent characteristics. In addition, the constant changes in the characteristics of the markets and consumer preferences generate the ideal scenario for the implementation of cooperation mechanisms among the stakeholders of a particular industry sector. Under these new conditions of complexity and changes in technology and markets, there is a great need for knowledge sharing among all members of the organization (Nooteboom, 2000). Also the generation of a link with the requirements of the environment for the development of innovative products and processes is needed.

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However, there are barriers to manage internal and external knowledge by a company: Coverage of information, organizational hierarchy, governance, the historical culture of secrecy, fear and lengthy implementation process (Burke, 2011). In many cases, the required knowledge to perform daily activities and achieve the goals of a company is not documented. Just have access to knowledge, specialists and managers with little interest in transmit it to the other members of the organization. This represents a series of unnecessary processes as a threat to organizational stability derived from the migration of staff by changes in their job preferences or generational relay in business management. However, if the companies had an adequate knowledge management, they can improve communication among members, document management, satisfying the requirements of users, quality, business objectives and organizational culture (Mehregan et al , 2012).

Subsequently, concepts and terms associated with knowledge management will be visited. Concepts like tacit knowledge, explicit knowledge and models that have been developed for implementation, which sometimes can be commonly used for various industrial sectors. However, some parameters must be adapted to the particular characteristics of each company.

Knowledge Management concept

The birth of KM as a discipline around the 1990s is accepted, due to the development and application of computational ability, spread through consulting firms and its promotion through conferences (Lambe, 2011). However, there has been confusion between the concepts of information and knowledge, which are usually treated and managed as a single concept in organizations. Information is defined as a set of facts and data that are organized to describe a particular situation or condition (Baskerville & Dulipovici, 2006). Knowledge is distinguished from information because this dataset is added with beliefs, thoughts, perspectives, concepts, judgments, expectations, methodologies and know-how (Wiig, 1993), which are linked with human intuition, residing in people´s mind. Therefore, people should identify, interpret and internalize knowledge (Myers, 1996) in order to transmit and apply it in their daily life, work, study and other obligations.

Knowledge management is the capability that owns the business staff to understand and manage organizational information through the use of technology and knowledge sharing (Dutta & DeMeyer, 2001). It also combines data and information in order to enhance the processes of innovation and creativity of people (Malhotra, 1998). Likewise knowledge

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management allows managing the organization, using applications, processes and technologies that enhance the creativity of individuals to achieve the objectives of the company (Gurteen, 1998).

However, one of the main objectives of knowledge management is to facilitate the transfer of knowledge from those who have it to the other members of the organization who need it to carry out its business activities efficiently. Therefore, the company should have an adequate communication structure to facilitate the transfer either directly or indirectly (Mahesh & Suresh, 2004). Aside from this structure, the company must design mechanisms for cooperation which facilitate access to information, promote their use and generate feedback from monitoring and control dynamic processes in an integrated way.

It is important to explain that much of this knowledge is provided by the minds of individuals. Transfer and application presents a greater challenge for management, who is responsible for designing strategies to assertively share this knowledge, reducing mistakes originated in the process of converting the knowledge from tacit to explicit. The following section will address more broadly the definition of these concepts.

Tacit and explicit knowledge

To understand the process of knowledge management, it is essential draw a distinction between the concepts of tacit and explicit knowledge. Tacit knowledge is acquired in the course of daily activities but generally the individual does not have awareness of what is being learned (Sternberg, 2000). Tacit knowledge is part of practical intelligence that represents the individual's ability to learn from experience and apply that knowledge in the pursuit of personal goals. Tacit knowledge is not codified and it is characterized by the know-how acquired through informal learning behaviors and procedures. Tacit knowledge does not involve the generation and acquisition of tangible products and processes or formal knowledge of intangible flows associated with specific research, technical or training (Howells, 1996); and it is expressed through the implementation of an expert, the processes of learning and training, and learning by doing (Fleck, 1996).

However, the definition of tacit knowledge has presented certain ambiguities (Gourlay, 2006). It is individual and collective simultaneously. It is acquired from experience but it also is innately in the individual. It can be acquired with the presence or not of other people. It represents a form of practical intelligence but it also has a defensive character. It facilitates

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routine behaviors but it also is a source of innovation. And finally, it can be converted into explicit knowledge or not.

Explicit knowledge is formal and systematic. It can be achieved through reading projects, manuals and discussion groups (Shao et al, 2012). It can be easily collected, documented, stored and retrieved independently of any individual, through media and technology systems (Delen et al, 2013). In addition, explicit knowledge can be communicated, understood and shared without the presence of a subject or individual and it will be easy to transmit and communicate through logical deductions and formal study (Polanyi, 1966).

It is important to formalize tacit knowledge and disseminate it to those in need within the organization. This commitment is in the goals and objectives that have been raised by managers (Arnett & Wittmann, 2014). The process of converting tacit knowledge into explicit knowledge cannot be executed if individuals do not have a specific guideline by their superiors. This guideline should be accompanied by the tools and infrastructure necessary to facilitate the transition from one form of knowledge to other, which cannot be limited to physical structures and norms. However, it must be accompanied by processes of leadership, training and monitoring in suitable environments that facilitate the processes of individual and collective learning.

Several authors have developed models that facilitate the integration and management of both types of knowledge, allowing improve overall organizational performance. Below the most important models are outlined, which due to their generality have been adapted to various business situations.

Knowledge Management models

One of the most accepted knowledge management´s model is described in the SECI model proposed by Nonaka and Takeuchi. The model has four stages of conversion of knowledge socialization, externalization, combination and internalization (Nonaka & Takeuchi, 1995). Socialization is to communicate the new tacit knowledge through shared experiences between individuals. Externalization crystallized knowledge making it available to be shared with another individual. Combination becomes explicit knowledge into more complex and systematic stages by collecting knowledge in and out of the organization. Internalization is

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the process of incorporating explicit knowledge into tacit knowledge to turn knowledge into a distinctly individual component.

Although it is the model with greater acceptance, it has had several criticisms about its formulation and design stage. First of all, it uses factors and variables that make it difficult the measurement of knowledge creation process (Andreeva & Ikhilchik, 2011). Likewise, it is a model based on the intuition that does not present clear methodology and appears to be built on observations from case studies (Martin & Root, 2009). Combination and internalization processes are not clearly described and include features that have not been demonstrated (Gourlay, 2003). And the process of knowledge creation is ambiguous because it not establishes who and how the new knowledge is justified during this process (Sundaresan & Zhang, 2012).

In response to these criticisms it have been raised other models that can be adjusted better to organizational requirements. The KIKI model (Zhang & Kosaka, 2013), takes into account customer oriented thought and it is supported on a process composed of collaboration, identification of service field, knowledge creation for new service ideas and implementation of service ideas. The Transfer and Knowledge Creation model (Hedlund, 1994) considers the interrelationship of tacit and explicit knowledge and its dispersion across the organization. This dispersion is analyzed in four different levels: individual, small groups, organization and external stakeholders.

The KPMG Consulting Group model (Tejedor and Aguirre, 1998), proposes the integration of a complex system of organizational structure, culture, leadership, learning mechanisms, the attitude of people and the ability to work in teams by using factors that enhance learning ability of organizations. Enterprise Based on Information (Drucker, 1988), proposes three major changes to be made within companies: transforming information in clear and precise indicators, optimization of business areas by removing or transforming those where there is repetition data; and project management in a way that the work is divided into specific tasks.

As the study object involves additional process of knowledge creation stages, another two phases will be used: Exploration and exploitation (Grant, 2002); (Manzanares & Gomez, 2008). The first of these phases includes knowledge acquisition, socialization,

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externalization, combination and internalization.. For its part, the second phase considers knowledge integration, transfer and storage.

As already mentioned, the management of knowledge exploration and exploitation must be accompanied by the identification and understanding of the resources and capabilities that the company has to achieve this goal. The importance of these concepts will be discussed in the next section.

RESOURCES AND CAPABILITIES

Resources

Resources are anything that can be thought as a strength or weakness of the firm (Wernerfelt, 1984). Resources are physical items that can be purchased, leased or produced by the firm for its use. People can contract the resources to enable the firm to be more effective (Penrose, 1959). Resources are heterogeneously distributed across the organization and these differences are stable over time; further resources must be valuable, rare, and imperfectly imitable and do not have strategically equivalent substitutes (Barney, 1991). Resources can be tangible or intangible. It can be physical such raw materials, equipment and funding. It can be Human expressed in training, experience and individual skills. And it can be organizational as face of the brand, processes and routines (Barney, 1991), (Marino, 1996); (Hafeez et al, 2002). However, few of these resources are productive (Grant, 1991) and it going to be really valuable for companies.

Therefore, the function of the company is to acquire, organize and manage tangible and intangible resources in a given market. Even so, organizational resources management involves a wider view that is directly related to the execution of business activities and the fulfillment of the corporate purpose of the companies. The concept "Capability" will be addressed below.

Capabilities

Entrepreneurial capabilities are formed through the coordination and integration of activities and processes; and they are the product of collective learning of all individuals and individual assets (Hafeez et al, 2002). Capabilities also respond to those routines and behavioral decision rules that define what firms make to perform a specific task (Nelson &

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Winter, 1985). An alternate definition given for capability is the ability of a team or resources to perform some task (Grant, 1991). This process requires learning from repetition; an organization employing an iterative routines or number of routines.

Likewise, capabilities involve a series of complex patterns of coordination between people; and between people and other resources. Similarly, the capabilities are the organizational processes that transform resources into strategic outcomes (Kaleka, 2012). These capabilities can be represented by elements or also activities such as design, purchasing, manufacturing, marketing, R & D, finance, management, among others.

Organizational routines

Routines can be treated like genes in the biological theory of evolution. They are persistent features and they can determine the behavior of an individual; they are heritable because tomorrow's organisms generated from today´s have many of the same characteristics, and they are selectable because people with certain routines may do better than others (Nelson & Winter, 1982). Within a company, individuals learn to solve problems through stable behavioral patterns or routines, and repetition of these procedures enables people to reduce the complexity of individual decisions. Routines that represent successful solutions to particular problems can also be considered capabilities of the firm; these are the result of history, experience and collective learning of the firm (Hafeez et al, 2002).

Organizational routines can be manifested in business activities and business processes to generate competitive advantage in the market (Teece et al, 1997). The routines are essential to convert resources of the firm in technological innovation capability, which helps in the improvement of performance of business processes (Wagner & Weitzel, 2007). Routines can contain implicit and explicit knowledge and through its integration facilitates information flow by promoting learning processes, which are internalized in the organizational memory (Becker & Zirpoli, 2008).

Routines cannot be left static over time and it must be renewed in accordance with changes in business visions. The same applies to the capabilities that should be the focus of attention from management. In the next phase the concept of dynamic capability will be addressed, which is better adapted to the current environment and the uncertainty surrounding the company management.

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Dynamic capabilities

By employing resources, capabilities are more dynamic and complex and it need to be treated in a special way and independently of resources (Hafeez et al, 2002). Markets and customer interests are constantly changing; therefore, if an organization wants to remain competitive, it must adapt itself quickly and effectively to new requirements. Thus, the concept of dynamic capability appears to explain this process of adaptation to changes imposed by the environment.

First of all, the terms dynamic and capability must to be define separately. The term dynamic refers to renew organizational skills in line with changes in the environment. Capability concept emphasizes the key role that strategic management has to adapt, integrate and reconfigure internal and external organizational skills, resources and functional competences to match the requirements of the firm with the constantly changing environment (Teece et al, 1997).

Similarly, the dynamic capabilities are established for a specific strategy in a specific organizational process such as product development, alliances, and strategic decisions that create value for firms in dynamic markets by manipulating resources to create new value strategies (Eisenhardt & Martin, 2000). As organizations learn new skills, it acquires diverse sources of knowledge to solve organizational problems and the fulfillment of business goals and objectives (Winter, 2000).

It is important to note the relationship between resource, capability, knowledge management; and its effect on the business structure and management. The most important aspect of this relationship is to create value for organizations, markets and the consumers. Besides the effect the relationship has on organizational performance and the generation of competitive advantage.

Resources, capabilities and knowledge management

As already was explained, there are certain characteristics that contribute to the use of knowledge to create value through firms (Grant, 1996). Among these characteristics are found: Transferability by individual access to knowledge through practice, the aggregation capability to express knowledge in a common language, the appropriation to receive a return

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equal to the value created by the use of a resource, and specialization in knowledge acquisition because of the limited ability of human brain to acquire, store and process it.

Organizational knowledge acquired in this process is a fundamental link between a set of opportunities for knowledge, skills and incentives; it has economic efficiency of exploration, development and operation (Dosi et al, 2008). It is important to identify the knowledge of a person to add economic value to the firm. This knowledge must be acquired, analyzed, processed and disseminated in favor of an improvement in the collective performance of all members of the organization.

TECHNOLOGICAL INNOVATION CAPABILITIES

The main interest of the study is to look at the effect which has different stages of knowledge management on technological innovation capabilities and how those relationships interfere in organizational performance. The study are going to measure this performance in terms of product and process innovation in a market every more demanding and competitive. Organizations are faced with the need to adapt, innovate and develop new capabilities from the right mix of resources (Yam et al, 2004).

Technological Innovation Capabilities represent a special class of goods and organizational resources including technology, products, processes, knowledge and experience (Guan & Ma, 2003). Technological innovation capabilities are the set of characteristics of a company that facilitate and support technological innovation strategies. It generates high economic value for the company (Yam et al, 2010); (Burgelman et al, 2008). Proper identification, exploration and implementation of technological innovation capabilities depend of organizational opportunity to achieve a competitive and sustainable market position through innovation processes that are efficient and differentiators.

Technological innovation capabilities are usually grouped into blocks that contribute to their identification, use and understanding (One & Ma, 2003) ;(Yan et al, 2004); (Aguirre & Robledo, 2010). For drafting this work the authors are taking into account a final block comprised by the following capabilities: Learning, R & D, resource management, manufacturing, marketing and strategic management.

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Learning capability

Learning capability is defined as the ability of an organization to identify, assimilate and exploit information and knowledge generated in the environment (Yam et al, 2004). Knowledge of the environment must be combined with knowledge from the organization to respond to the internal requirements of the firm and the needs that have been raised by customers. Learning ability also includes organizational and management characteristics, practices, skills and factors that facilitate organizational learning process (Akgün et al, 2014).

R & D capability

R & D capability is the ability of the company to integrate research and development strategy, implementation of projects, project portfolio management and R & D expenses (Yam et al, 2004); (Aguirre & Robledo, 2010). R & D capability allows the firm to integrate R & D strategy with organizational mission and vision, the investment level in R & D and the accumulation of new technological knowledge (Kocoglu et al, 2012).

Resource management capability

In order for the organization to develop all the technological innovation capabilities effectively, it requires an adequate management of their physical, human, structural and financial resources. All this aims to respond adequately to the different requirements generated by internal and external customers of the company, during the different stages of the innovation process. Resource management capability is described as the ability to manage policies and procedures to support the exploitation of valuable, rare, difficult to imitate and expensive resources (Cuerva et al, 2014). Similarly, resource management capability allows the firm to build a well-established organizational structure, coordinating the work of all activities to share common goals and influence the speed of innovation processes through the infrastructure created for the development of projects (Guan & Ma, 2003).

Manufacturing capability

Manufacturing capacity is closely related to the coverage of the needs and requirements of customers by the right combination of operational and structural resources which the organization has. Manufacturing capacity is defined as the ability to transform the results of R & D on products that know the needs of the market according to the design requirements and can be manufactured in batches (Guan & Ma, 2003); (Yam et al, 2004); (Aguirre & Robledo, 2010) and this capability uses the benefits in production costs that bring scale

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economies. Similarly, manufacturing capability enables the firm to achieve goals related to production and it involves aspects such as product quality, cost, time, volume and performance (Terjesen et al, 2011).

Marketing capability

For every firm is vital that their innovation processes impact the market in which it operates. Marketing capability is defined as the firm ability to advertise and sell products based on the understanding of customer needs, competitive environment, costs, benefits and acceptance of innovation processes (Yam et al, 2004). The market acceptance is achieved only when it is transmitted to the client privileges and profits that can be obtained through the use of a particular product. The most important marketing capability aspect is an adequate identification of the customer.

The outstanding definitions in the literature for marketing capability include: The ability of the firm to use its inputs and resources, such as financial and existing customer base to generate desired sales (Ahmed et al, 2014). Similarly, marketing capability is defined as the ability to decode the course of customer's needs through the acquisition of information to address their requirements through planning, investment and implementation of marketing strategies (Wu, 2013).

Strategic management capability

Strategic management capability is the ability of business direction to ensure productivity, performance and organizational harmony by decision-making (Kim & Nelson, 2000). However, the effectiveness of strategic management capability should be monitored and evaluated, even after the implementation of the strategy to ensure compliance with the objectives and suggest improvement actions towards superior performance. Strategic management capability has been regarded as the business ability to identify internal strengths and weaknesses and external opportunities and threats. So that action plans fit with the mission and vision of the company and it is finally processed with execution (Yam et al, 2004).

Strategic management capability allows an appropriate mix of products, resources, processes and systems, which can affect the efficiency and performance of innovation processes in the long term (Qiang & Ye-wei, 2010). It takes into account the time factor

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because innovation processes take a long time in their development and implementation. The success of innovation must be constantly evaluated in order to determine the existence of failures in the process and determine whether the implementation of a new innovation cycle is needed (Chen et al, 2008).

There is a causal link between the phases of knowledge management and technological innovation capabilities. This relationship has a dynamic behavior in accordance with previously planning and it interferes directly in strengthening innovation processes. The success of this relationship is reflected in the increase of firm's profits. These findings are going to be discussed in a later section. Similarly, the causal link can be replicated in any company from any industry.

Technological innovation capabilities and knowledge management

Knowledge management and technological innovation processes have become very relevant for companies because firms have a real interest in maintaining a competitive and reliable market position. Companies spend considerable time and resources in the implementation of KM in the firm. Also the relationship between the two terms needs to be understood because sometimes these concepts are difficult to identify for the characteristic of intangibility.

Consequently in the knowledge acquisition phase, the leaders of each department are responsible for obtaining all necessary information from customers and suppliers in order to establish the continuous improvement of the quality of products and services. Furthermore, knowledge acquisition reveals the financial status of organizations, skills and experience of employee and product preferences of customers (Ooi, 2014). Also, through the acquisition of knowledge the company can understand the true value that customers give to new technological changes or discoveries (Bojica & Fuentes, 2012). By this, a firm can evaluate the adoption and market entry of these new products and services.

However, organizations should have all the resources needed to exploit the knowledge it has been able to acquire from stakeholders. Companies can take advantage from new business opportunities derived from innovation processes (Maurer, 2010). Through the processes of knowledge acquisition, the capabilities that are activated are strategic management, R & D and manufacturing.

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Knowledge creation helps all members of the organization who are involved in the development of a project that they can interact with the new processes or prototypes to generate improvement actions (Mahr & Lievens, 2012). Knowledge creation helps in improving the creative processes to satisfy the needs of customers. Also the processes of knowledge creation allow the division of staff in work teams, which require incentives from the firm to exploit its potential in the development of projects.

The most relevant expected results of the process of knowledge creation are: Generation of organizational assets such as experience, equipment, patents, databases; it reduces costs of product and services development processes; it increases the perceived quality of the offered goods; it responses to market requirements through innovation processes and finally it increases the speed in making business decisions (von Krogh & Geilinger, 2014), (Martín de Castro et al, 2008), (Esterhuizen et al, 2012). The most remarkable capabilities at this stage are strategic management and R & D.

Meanwhile, knowledge integration has a positive effect on the performance of new products and services that are going to be launched to the market. It enhances marketing capabilities and production (Yang, 2005). Besides knowledge integration influences the work in teams where experience traits are well marked. Similarly, the integration allows synthesizing diverse sources of knowledge which contributes to the generation of new products and services (Huang, 2014). Knowledge integration also includes the capabilities of strategic management and R & D.

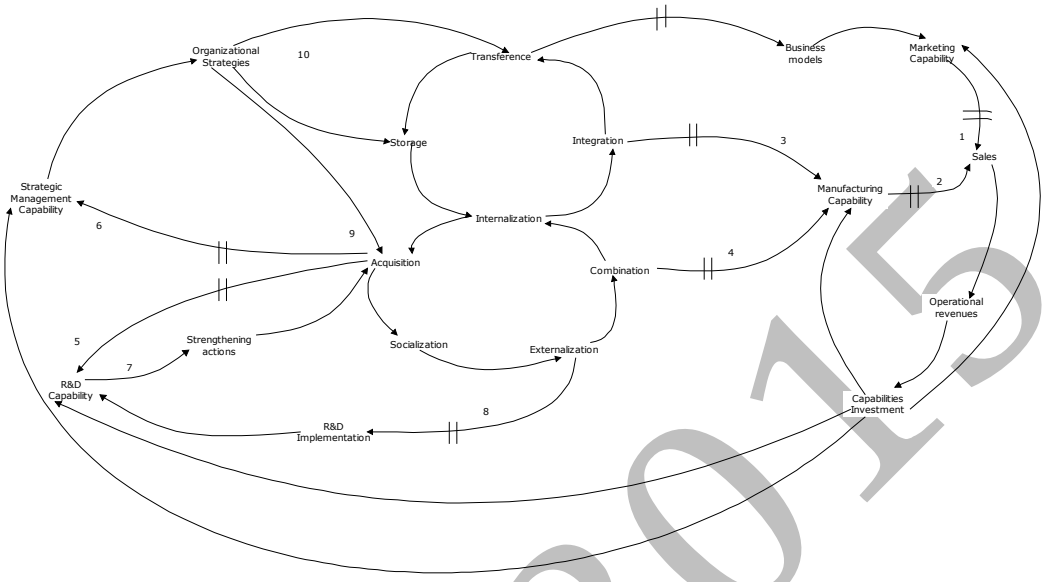
Finally, knowledge transfer and storage improve the financial performance of the firm and enhance flexibility in business processes in order to respond to the changing market (Blome et al, 2014). Knowledge storage and transfer improve relationships between members of the organization (Yakhlef, 2007) due to the need to establish a medium of communication for all individuals involved in the process of products and services development. The most remarkable capabilities at this stage are marketing and strategic management.

Therefore the study authors are looking to integrate the phases of knowledge management with technological innovation capabilities. They want to understand how these variables

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interact and interfere in the organizational results. In order to achieve this goal, they have developed a causal diagram that is presented below.

Figure 1: Causal Diagram of KM and Technological Innovation Capabilities



In Figure 1, it is shown graphically the relationship of causality between the phases of knowledge management and technological innovation capabilities that was previously described. Reinforcing cycles show that if managers of the firm make decisions to strengthen one of the variables of interest, the other associated variables will also be strengthened. Similarly, delays are associated with the learning process of the effects of one variable on another one. Those effects are not immediate and take some time to appear. This period of time is closely related to the individual characteristics of each organization and how the firm develops new knowledge management and innovation processes. Finally, reinforcing cycles show that not all knowledge management phases are involving in equal proportion on the development of technological innovation capabilities. Management should coordinate the personnel in charge of innovation processes. It must identify the factors involved in each phase of knowledge management. It must establish the guidelines to make appropriate use of available resources for management and link it with the requirements for the development of technological innovation capabilities.

Table 1 presents the sources of information that led to the creation of the causal diagram (Figure 1). Also, Table 1 summarizes the relationship between knowledge management and technological innovation capabilities.

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Table 1: Causal diagram, sources and connections

Connections	Source	Observations
1	(Yam *et al*, 2004); (Guan & Ma, 2003); (Chen *et al*, 2008); (Ahmed et al, 2014); (Wu, 2013); (Prašnikar et al, 2008)	• Promote and sell products based on demand. • Advertise, sell products and achieve acceptance of innovation processes. • Introduce and sell products based on customer needs knowledge. • Understand customers' needs to develop new products from the combination of organizational resources.
2	(Terjesen et al, 2011); (Chen *et al*, 2008)	• Reaching quality, cost, time, volume and performance goals. • Generate new production techniques and improve product quality. • If there is a better performance and better quality, it is expected to have a positive increase in sales.
3	(Yang, 2005)	• Develop marketing and production capabilities by measuring the performance of new products. • Measurement of performance of new products, allows the firm to integrate environment knowledge with specialized knowledge.
4	(von Krogh & Geilinger, 2014)	• Speed in making business decisions. • Reduce products and services development costs. • Combination of explicit knowledge reduces rework production.
5	(Yam *et al*, 2004); (Bojica & Fuentes, 2012)	• Generate strategies for R & D and expenses associated with the development process. • Identify the perspective of clients in respect of new technological developments.
6	(Ooi, 2014); (Maurer, 2010); (Guan & Ma, 2003); (Guan *et al*, 2006); (Ford *et al*, 2003)	• Develop new products and strategic alliances. • Acquire knowledge from employees, customers and suppliers to improve the quality of products and services. • Adopt strategies to the constantly changing environment.
7	(Yam *et al*, 2004); (Kocoglu *et al*, 2012); (Lukas & Bell, 2000)	• Generate strategies for R & D and expenses associated with the development process. • Discover and develop new products or expand existing products and services. • Invest in R & D and accumulate new technological knowledge.
8	(Yan-Rong & Qiao-Ling, 2009)	• Reduce the risk associated with decisions of innovation, combining different types of knowledge and enhance individual skills.
9	(Guan & Ma, 2003)	• Adopt strategies for constant changes in the environment.
10	(Yakhlef, 2007); (Mahesh & Suresh, 2004); (Nwankpa & Roumani, 2014); (Blome et al, 2014)	• Establish communication channels between members of the organization. • Establish appropriate communication structures to facilitate knowledge transfer.

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CONCLUSIONS

Knowledge Management stages and its interaction with the technological innovation capabilities, becomes into a guide for organizations that performs technological development procedures. This interaction articulates the resources management, capabilities and processes with the corporate strategy. However, for its compliance it is necessary to have leadership skills and assertive communication channel which encourage the creativity of individuals to obtain a greater degree of engagement with innovation processes.

Also, the conversion of tacit into explicit knowledge requires the use of tools that facilitate this process to all members of the organization. These tools include the strengthening of culture, staff training and generation of communication channels for knowledge exploration and exploitation. Knowledge becomes a valuable resource for companies to develop technological innovation capabilities. Knowledge takes into account business strategies and actions to strengthen R & D that are taken from management, it will become into innovation processes.

The competitiveness of different industrial sectors must be linked to the development of methodologies and tools who act transversely to the operation and management of all sector organizations. When economic sectors close the gaps in terms of profits between a company and another, so it will be possible to talk about a successful position in markets in which every firm operates. For this purpose, it is necessary to establish mechanisms for cooperation and information transmission for proper development of innovation processes. Therefore, companies have to center their efforts in the suitable accumulation of knowledge, in order to apply it in the creation of economic value to exploit efficiently their technological innovation capabilities and generate competitive advantages.

The relevance of the study is to establish a causal relationship that facilitates the interaction between the phases of knowledge management and technological innovation capabilities. This interaction has not been addressed comprehensively in previous research. However, the study based on the literature review could verify the existence of causality between knowledge and innovation and the importance it has in terms of organizational results.

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Learning Styles Of The Pedagogical Formation Students

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Abstract
The objective of this research is to determine learning styles of the prospective teachers receiving training on pedagogical formation. Additionally it is to find out the relation between their sex and faculty they have studied and the learning styles. The working group of the study is consisted of 470 students that receive training on Pedagogical formation in the Teachers College, Inonu University. For data collection, the Grasha-Reichmann Learning Style Scale, as adapted to Turkish by Sarıtaş and Süral (2010), has been used. The data thus obtained was analyzed by the statistics software SPSS 20. In the study, point mean was used to determine distribution level of the learning styles of the prospective teacher. For analysis of the resulting data, Mann Whitney U and Kruskal Wallis Test were used. As to the means in the lower dimensions of the learning styles of the pedagogical formation students, the dependent, independent, contributor, reserved and cooperative learning styles are found to be at the medium level, and the competitive learning style at the higher level. It is seen that the prospective teachers graduated from the Faculty of science/letters are more competitive than the prospective teachers graduated from the Faculty of theology in terms of learning style. In the comparison made by sex, it has been determined that the female prospective teachers are more collaborative and the male prospective teachers are more reserved.

Key Words: Pedagogical formation, Individual difference, Learning, Learning style.

INTRODUCTION

Teacher is, as the one of the most important variables of the input level of the training as system, the executive of the learning function, a basic aspect of the training. In the training process of the training, the teacher should gain the required professional knowledge to execute the teaching activity. In order to provide such competent, the prospective teacher should receive pedagogical formation training at the higher education organizations. The learning is achieved by means of the teaching activities executed by the teacher properly. Learning is the product of a life-long process consisting of interaction of a series of physiological, biological, psychological and social variables. Learning is a series of comprehensive and constant actions that cannot be limited to any section and setting of the life. However, a regular, permanent, purposive and constant structure of the learning depends on realization of certain stages (Aydın, 2007, s. 311). As the concept of learning itself cause differentiation (Barut, 2011, s. 41), we may not mention about an excellent definition to describe the learning.

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Although the factors affecting the training are categorized as genetic and environmental factors, the self-respect and sex as the individual differences resulting from these factors also affect the learning (Bacanlı, 1997, s. 95-96). And there are a great number of variables that create difference in the learning process. Some of them include learning environment, knowledge and skills of the teacher, curriculum and materials used. The most important of these variables is presumably the contribution made by the learner to the process. A variety of parameters such as the identity of the learner, learning requirements of him/her, learning styles, motivation, strategies used when learning and personal traits are basic factors that form differences of success (Kuzgun and Deryakulu, 2009, p. 316).Learning as a complex process is affected by the genera ability, cognitive process, feelings, motive, developmental characteristics, prior knowledge, background experience, family and social culture. Naturally, such wide range of factors affects the learning process of the individuals, resulting in differentiation (Erden and Altun, 2006, p. 20).Each individual show difference in terms of ways and methods he/she prefers in having and processing the information. Consequently, each student has a different learning style. In short, while some students prefer active and interactive learning, the other tend to be more *personal* acting according to their own feelings (Oral and Avanoğlu, 2011, p. 253).

Learning Styles

Style is an individual's own qualities that are associated with his personality, differentiating him/her from others. Just as the athletes and artists have their own styles, the learners have also learning styles proper to them (Güven, 2004, s. 21). Just as everybody has a style in the fields such as clothing and driving, it also applies the learning. While some people, for example, prefer working in a quiet environment, along and by taking notes, the others may work together with a group of people or by listening music. Such preferences signify the learning styles of the individuals. Style indicating individual preferences, although may be in common with others, are specific to the individuals. It is relatively static and a dimension of the personality of the individual (Erden and Altun, 2006, p. 21). In addition to the personality of the learners, their cognitive structure has also an effect on the learning styles. While some persons process the information, concrete and associated with each other, the others ten to get information, abstract and independent of each other. For learning a subject, individuals that relations and concrete indicators or individuals that seek to

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conceptualize by themselves can be given as example. And the students may also differ in terms of categories they used. While some students use a quite limited number of categories to categorize the events or objects, the others may use high number of categories. Those preferring a limited categorization tend to categorize the information as black-white, those dealing with the information in a wide range prefers categorization in gray scale (Bacanlı, 1997, s. 91). Factors generally recognized to have effect on the learning are group characteristics reflecting identity and cultural traits of the students, prequalification of the students and the learning style and preferences of the students (Babadoğan, 2011, s. 267).While some, for example, prefer learning by listening, some may prefer by directly taking place in the material, that is, they use different ways of learning. And this signifies that the learning styles are ways of cognation specific to the individual. While the learning style makes the same type of teaching applied in the classrooms perfect for some students, it may make it unbearable for others (Fer, 2011, s. 200).

In the learning process, the learners take advantage of learning strategies depending on their own learning style. Consequently, the learning style of an individual is also decision for the learning strategies. For this reason, one of the targets aimed by the teachers in the learning process is to discover learning ways of the students. It contributes to effective and permanent learning (Cırık, 2011, s. 185). To know the learning styles of the students in the education-training environments would create opportunities to be aware of the weaknesses and strengths of the individuals in the learning cycle, take measures to improve the weaknesses, bring together the individuals suitable to study together, pay regard to the diversity in the classrooms and prepare learning environments and training schedules to positively affect the success, interest and motivation of the students (Kurbanoğlu and Akkoyunlu, 2008, p. 305).

Grasha and Reichmann Model of Learning Styels

Learning style typology developed by Grasha and Reichmann is based on the actual reactions of the students in the learning environments. Grasha has emphasized that such approach to the learning styles of the students has higher possibility to deliver effective and reliable results Grasha and Reichmann typology was designed to determine teaching techniques for the teachers on basis of individual learning styles. And it provides advantage to this approach (Montgomery and Groat, 1998, p. 5).

Grasha and Riechmann have examined the learning styles of the university students from a social and emotional perspective. Grabowski and Johansen have pointed out that it may in a sense be classified as the social interaction scale because it emphasizes not on how the learner

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perceives and organizes the information, but on the teacher in the learning environment and the style patterns preferred by the students for interaction with other classmates (Rimmerman, 2005, s. 41-42).

Learning styles of the students vary according to the method used by the teacher. If the teacher, for example, rather focuses on the assignments that require the students to work in cooperation, this would reinforce the cooperative learning style of the students (Kumar, et.al., 2004, p. 534)

Grasha classifies the learning styles in three dimensions by dealing with types of contrary learners contrary to each other.

Competitive: It is a learning style basing on the belief that more performance should be shown individually in order to be awarded in the competitive environment of the classroom. The competitive style motivates the students not to give up and determine targets in the learning process. It may adversely affect the less competitive ones and prevent to grasp value of the corporative cooperative learning skills.

Cooperative: It is a type of student feeling that he/she learns better by sharing his/her ideas and skills. They enjoy to work together with their teachers and other students. Working in a group and team enhances their skills. However, they cannot prepare as good as the competitive individuals. They are dependent on others and do not show the same performance by themselves.

Reserved: They are not very willing for participation in the course and for learning. They do not join the teachers and students in the classroom. They are not interested in things that happen in the classroom. When they take significant steps that may change their life, they are not affected by anxiety and tension. However, their performance is low. While the negative feedback reminds them of their failure, they are far away from determining productive targets.

Contributive: They are good citizens of the classroom. They enjoy to contribute to the course as much as they enjoy other activities. They try to perform the obligatory and optional tasks as far as possible. However, they do more than required and put the requirements of the others before their own requirements.

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Dependent: They have very little intellectual interest and learn only the obligatory subjects. They regard their teachers and classmates as a part of the building and consider all kinds of authoritative figure as a specific directive indicating what should be done. They may keep their anxiety under control and have clear tendencies. However, they may not improve their ability to act by themselves and cannot know how to deal with uncertainty.

Independent: They enjoy thinking of themselves and are sure about their learning capabilities. They prefer to learn the subjects they consider to be important and prefer to work by themselves, rather than working together with other students. Although their ability to take initiative and find their own way, they have some deficiency in their cooperative skills (Grasha, 1996, s. 128).

According to Beck (2001), a number of studies have shown that teaching formulated according to the learning styles of the students help enhance the success of the students. Besides, many teachers and executives have quite limited experience in analyzing the results of the scales of learning styles and implementing the most appropriate learning strategy. Although awareness in this respect has improved to a certain degree in the current training system, we may hardly say that a significant development has been made.

OBJECTIVE OF THE RESEARCH

The objective of this research is to study the learning styles of the prospective that receive training on pedagogical formation and the variables such as sex and faculty the students graduate from that are considered to have effect on the learning styles they have.

METHOD

This section concerns the traits of the working group, data collection tools and statistical techniques for data gathering and analysis.

Research Model

This research is made on basis of the relational screening model as descriptive research which aims at researching the events and furthermore determining the research and existing status. Events and situations dealt with in such type of researches are studies in detail and their relation with a variety of variables is examined to describe what they are. The screening models widely used in the social sciences are researches where comments and treatment of

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the individuals in a group about a phenomenon and event are taken and described(Karakaya, 2012, p. 59, Aziz, 2013, p. 25).

Working Group

The research was conducted by using date obtained from the pedagogical formation students in Inönü University. As the research aims at having access to all students currently in the program, no sampling was made. The research included 470 students, who are accessible and receive training on pedagogical formation and for whom research-related data could be obtained. General information about the working is given in the Table I.

Table 1. General Information About the Working Group

		Gender		
		Female	Male	**Total**
Faculty	Science/Letters	197	134	**331**
	Theology	71	34	**105**
	Fine Arts	23	11	**34**
Total		**291**	**179**	**470**

The working group is consisted of 291 female and 179 male students. Of them, 331 graduated from the undergraduate program of the science-letters, 105 from theology and 34 fine arts.

Data Collection Tool

In the research, Grasha-Reichmann Scale of Learning Style was used as data collection tool. The scale is consisted of six dimensions, each containing 10 items. The scale contains questions of five point Likert Scale. The scale was adapted to Turkish by Sarıtaş and Süral (2010). According to the implementation results of the adapted scale, Cronbach Alpha reliability coefficient was determined as 0,802. According to Grasha-Reichmann Scale of Learning Styles, each learning style is categorized at three levels, i.e. “low”, “medium” and “high”.

Data Analysis

SPSS software was used for analysis of the data obtained in the research. In order to find out at what degree the students are dominant in which learning style, the mean of the scores obtained from the scale was used. For determination of other analyses to be used in the data to

be collected for the research, it is found out that the data do not show normal distribution in the results of the Kolmogorov-Smirnov normal distribution test. For this reason, non-parametrical data analysis methods have been used for analysis of the data. While Mann Whitney U Test is used in the analysis of independent variables having two categories, Kruskal Wallis H Test was used for analysis of the independent variables having more than two categories.

FINDINGS AND COMMENT

This section contains statistical analysis of the data obtained from the working group and interpretation of the findings.

Table 2 shows the learning style levels according to the mean points the prospective teachers receiving training on pedagogical formation at the lower dimensions of the scale of learning styles.

Table2. Average of the Points Scored by the Prospective Teachers in the Scale of Learning Styles

	Independent	Dependent	Contributory	Reserved	Cooperative	Competitive
Mean	3,45	3,41	3,21	2,40	3,45	2,92
Level	medium	medium	medium	medium	medium	high

Looking at the mean scores of the prospective teachers receiving training on pedagogical formation in the lower dimensions of the learning styles, we see that they have dependent, independent, contributory, reserved and cooperative learning styles at medium degree and the competition learning style at high level. A number of researches made on the prospective teachers that study in the teachers college show high level of competitive learning style for the prospective teachers (Tatar, Tüysüz and İlhan, 2008, p. 188; Alşan, 2009, p. 125). That the competitive learning style is at high level in a number of researches made on the learning styles of the prospective teachers signifies that competition plays a significant role in the learning process. Enhancement of the education an maximization of the academic achievement of the students is possible only by an education environment that emphasizes on the learning styles with presence of competition at a certain level (Çaycı and Ünal, 2007). The positive effect of the interpersonal competition in the in-classroom action on the academic achievement on the one hand and the intergroup competition on the achievement of the group by reinforcement of the cooperation in the group should be remembered. Besides, a research made on the learning styles of the pedagogical formation students shows that great majority of

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the prospective teachers has learning style with characteristics of being reserved and basing on reasoning (Güneş and Gökçek, 2012, p.34).

Table 3 gives findings from Mann-Whitnet U test conducted to determine relation between the scores of the pedagogical formation students on the independent, dependant, contributory, reserved, cooperative and competitive learning styles and their sex.

Table 3. Results of Mann – Whitney U Test on Basis of Learning Style Scores by the Variable of Sex

Learning Style	Gender	N	Mean Rank	Rank Sum	U	p
Independent	Female	291	229,32	66731,50	24246	,208
	Male	179	245,55	43953,50		
Dependent	Female	291	243,87	70967,50	23608	,088
	Male	179	221,89	39717,50		
Contributory	Female	291	251,03	73049,50	21526	**,002**
	Male	179	210,25	37635,50		
Reserved	Female	291	218,28	63519,50	21034	**,000**
	Male	179	263,49	47165,50		
Cooperative	Female	291	235,94	68659,00	25916	,928
	Male	179	234,78	42026,00		
Competitive	Female	291	239,37	69656,50	24919	,431
	Male	179	229,21	41028,50		
Total		**470**				

Looking at the mean ranks in the Table 3, it shows that the male prospective teachers are more independent and reserved and the female prospective teachers are more dependent, contributory and competitive as learning style. However, according to the analytical results, the female prospective teachers are more contributor (U=21526) and the male prospective teachers are more reserved (U=21034). This is a quite common situation frequently encountered in the similar researches as well (Deniz, 2013, p.676; Altun and Canca, 2011, p.1995; Keleş, 2009, p.58; Süral, 2008, p.69).The students featuring high level of contributory learning style get pleasure from contributing to the course as much as they get from other actions. They try to fulfill the obligatory and optional task as far as possible. They get maximum benefit from any kind of classroom experience; however, they perform work more than required may put needs of others before their own needs. The reserved students are not very willing with respect to contribution to the course and learning. They are not sufficiently interested in what happens in the classroom. When they make important decisions, they are not affected by anxiety and tension. They prefer entertaining, but less productive tasks. Naturally, their performance is low. For such type of learners, negative feedback is a thing that reminds them their failure. They are far away from setting productive targets (Grasha,

1996, s. 128). The reason that the male students exhibit reserved behavior in the education-training actions may be their anxiety to make mistake (Tarhan, 2005, p.146).

Table 4 shows results of Kruskal Wallis H Test conducted to determine the relation between the learning styles of the pedagogical formation students and the faculty they have graduated.

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Table 4. Results of Kruskal Wallis H Test Showing Scores of Learning Style Versus Faculty the Faculties They Graduated

Learning Style	Faculty	N	Mean Rank	df	X^2	p	Significant Difference
Independent	Science/Letters	331	243,74	2	4,174	,124	
	Theology	105	217,19				
	Fine Arts	34	211,81				
Reserved	Science/Letters	331	230,71	2	1,615	,446	
	Theology	105	249,96				
	Fine Arts	34	237,50				
Cooperative	Science/Letters	331	237,29	2	,254	,881	
	Theology	105	229,64				
	Fine Arts	34	236,12				
Dependent	Science/Letters	331	234,73	2	1,304	,521	
	Theology	105	229,98				
	Fine Arts	34	260,09				
Competitive	Science/Letters	331	249,31	2	11,915	**,003**	**S/L-T**
	Theology	105	198,87				
	Fine Arts	34	214,16				
Contributory	Science/Letters	331	242,61	2	3,309	,191	
	Theology	105	215,40				
	Fine Arts	34	228,34				
	Total	**470**					

(p<,05)(X^2=5,991)

The competitive style scores of the students differ significantly basing on the faculty from which they graduate [X^2 (2) = 11,915 - p<,05]. Mann Whitney U Test was conducted to determine haw such differentiation has occurred among the faculties. The results show that the prospective teachers who graduate from the science/letters faculty are more competitive than the graduates of the faculty of theology. For students with high level of competitive style, showing better performance than the other students is important. They believe that they should compete with other students to be awarded at the end of the process. They enjoy to draw attention and distinguished due to their achievement in the classroom. The competitive style motivates the students that that they should not give up and set targets in the learning process. However, this situation may adversely affect the less competitive ones and may prevent acknowledgement of the value of cooperative learning skills (Grasha, 1996, s. 128).

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CONCLUSION AND SUGGESTIONS

Conclusion

Individuals have different preference to acquire and process information. If the learning style of the student and the teaching style of the teacher do not match with each other, appearance of the lack of self-reliance, poor performance and learning disability is highly possible In recent years, these differences in the learning preferences have always been the interest of the trainers who constantly follows improvement of their students at all stages of the education (Clement, Keith and Keith, 2014, p. 46).An effective teaching requires flexibility, creativity and responsibility for such training environments to fulfill individual needs of the learners (Tulbure, 2012, p. 1).A sensitive teacher needs to know the learning styles preferred by his/her students to plan his/her courses. And a wise teacher requires developing a wide repertory of teaching strategy that corresponds to these different learning styles (Beck, 2001, p. 14).

This research aims at determining the individual learning styles of the pedagogical formation students, each being a prospective teacher. As to the means in the lower dimensions of the learning styles of the pedagogical formation students, the dependent, independent, contributor, reserved and cooperative learning styles are found to be at the medium level, and the competitive learning style at the higher level. Additionally, the learning styles were dealt with basing on variables such as sex and the faculty they have graduated from. Especially the faculty they graduated is one of the most important differences that distinguish the pedagogical formation students from the prospective teachers graduated from the teachers college. The results of the research in this respect show that the prospective teachers who graduate from the science/letters faculty are more competitive than the graduates of the faculty of theology in terms of learning style. According to the comparison made by sex, the female prospective teachers are found to be more contributory and the male prospective teachers are more reserved.

Suggestions

- As awareness of the prospective teachers with respect to the learning styles will ensure them to understand their roles in the classroom, such type of researches should be made on the similar groups.
- Furthermore, comparisons should also be made by determining the learning styles.

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- The information obtained should be shared with the prospective teachers for mutual assessments.
- And the prospective teachers should be informed about significance of finding out the learning styles of their own students.

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Life-Long Language Learning In Science Perspectives

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Abstract
This paper is a report on the issues of long-life language learning (LLLL) in science perspectives, the role of a language in science in particular. The descriptive analysis of methodological techniques and approaches were used to examine the scientific or professional English language learning and teaching for evidence of postgraduate students in Kazakhstan. The authors state that most postgraduate students face many problems to present their presentations or scientific papers in a comprehensive manner for other researchers or groupmates. Moreover, when it comes to reading a paper by international audience it must be fully understandable, so that the paper could attract interest and become popular. And here another problem with translation rose: that idea or part of it can be lost; especially when a technical paper is concerned. Finally, the authors believe that educators need to take a serious attention to life-long language learning in Kazakhstan higher education system because it is a right thing to do for a researcher.

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INTRODUCTION

What language do you think of when you hear the word “science”? Probably you might think of numbers, formulae, figures, but it is not a secret, that, nowadays, science is a collaboration of scientists from all around the world. So, in order to work effectively one must speak as many languages as possible. Let us talk about the role of a language in science.

In the science world experiments, data collection, and results obtainment – they all play a big role; however it is really crucial to be able to present your final result. So, for a scientist it is important to release a paper in language of area he/she wants to dedicate that paper to, because for a researcher it is important to fund his/her project and one of the sources is international researchers association. The best way is to speak the language of a paper publication. Nowadays, many countries have developed scientific base. Europe, the U.S., Australia, Canada mostly use English, French and German. But there are also strong research centers in Japan, South Korea, China, and Russia that prefer their own languages. It is a big advantage for a scientist to speak several languages, so he/she can read someone’s papers or work together for a shared problem.

What about using one science language? At the moment majority of papers are published in English, less in French, German, Russian, Japanese, and Chinese. So, of course, practically, it would be easier to bring all scientific papers to English language. Important scientific

journals accept papers only in English. This is an opportunity for scientists from the countries with less developed science to be heard in researchers' community. However, for non-English speaking countries with established research base it would be difficult to shift to English language. They will continue to use their own language, which is also good, as an example of culture conservation. Hence, idea of science language unification is not viable. Thus, in this context, it is important for a scientist to speak as many languages as possible. It broadens horizons of his or her opportunities in the science world. So, life-long language learning is a right thing to do for a researcher.

LIFELONG EDUCATION

Learning throughout life is becoming an educational principle which is being contextualized in the higher education of Kazakhstan in the age of globalization in the 21st century. The adoption of this lifelong education in science perspectives is dictated by the present time when more and more professionals are required to meet the rigid demands on international labor market. Moreover, efficient and successful teaching and learning strategies are very important and crucial to educational success and prosperity and lifelong education in science perspectives as well. In addition, building learning societies and creating open learning communities are only possible with the triumph of learning. This can be established only by determining multiple ways of learning, knowing and producing knowledge. It means that it is necessary to define new paradigms about education and learning, the concept of professional learning in terms of profession-oriented English language learning in the conditions of multilingual science education in Kazakhstan, in particular. According to Jeff Cobb (2009) 'learning is the lifelong process of transforming information and experience into knowledge, skills, behaviours, and attitudes'.

In this context we have to understand why and how language works to promote the shortcut in taking new knowledge and learn according to the well-known four pillars of learning: learning to be, learning to know, learning to do, and learning to live together. Further, teachers and students could take lifelong education, in other words to continuing professional development (further CPD) which is about improving learners' performance and competency at work, enhancing their professional career prospects, increasing their capacity for learning and teaching and being more capable and confident when faced with change. The most important thing here is that students have to learn to communicate successfully in the context of their professional fields and interests.

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It is proved, that the rapid development of cutting-edge technologies highlighted the need for continuous training and formatting of new skills. In its turn, this requires to find out the new innovative ways to overcome the overwhelming amount of information. Taking into consideration the increasing interconnections of individuals, communities and research societies across the globe we have to recognise the need of reinterpret old ways of thinking, doing and taking stereotypes. And one of the ways is to reconsider approaches in adult literacy and higher education in science perspectives in Kazakhstan. Secondly is to analyze the challenges and opportunities for lifelong language learning in our case in the context of higher education in science perspectives, globalization and internationalization.

CONTENT-BASED APPROACH

Content-Based Language Learning (Brinton, Snow and Wesche, 1989) approach 'as the integration of content with language teaching aims' was used to teach the academic subject matter and foreign language skills. This approach draws upon concepts of curricular information and student's language acquisition skills. The meaning, structure, and use of language are socially and culturally relative (Gumperz, 1982). On the other hand, with the content-based approach (CBA) we also refer to content and language integrated learning (CLIL) which encourage students to think and learn via target language use while listening, speaking, reading and writing on the basis of authentic materials. Focus on content, meaning in discourse, consolidation tasks of what they have learnt, listened, and read is professionally constructed. Data were also examined for evidence of passive knowledge, active knowledge they use to interpret and evaluate the information provided, and a variety of receptive and productive procedures students were able to develop to be prepared for the range of academic demands they could have to face with. During their English classes and beyond students are asked to watch lots of English language TV and read in English content-based texts with multiple-choice tasks which satisfy the students' interests and needs and that have educational science relevance. We strongly support Richards' opinion (1990) that the methodology principle embedded in the English class focuses on teacher, student and materials engagements to see the whole picture of the educational process and provide support for learning, as well as establish a comfortable classroom atmosphere. Classroom activities involve many content-based tasks focused on information gap (e.g. jigsaw reading) and problem solving tasks which often have an element of unpredictability, demanding choice and decision-making among students who interact.

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The important thing which teachers have to keep in mind that the focus on professional English vocabulary acquisition through multiple exposures to the word in context, using extension of pair work from dialogues to exchange of information and opinions would be very helpful and useful. In addition, it is the most efficient way to improve the students' proficiency level. Moreover, the emphasis on content, topic and themes will appeal to students' needs and interests along with their linguistic competence and science education development at the same time.

According to Madrid, D. y García Sánchez, E. (2001) content-based approach is consequent with cognitive theories and constructivism, i.e. it aims to provide meaningful learning by connecting the new information with the students' previous learning experience. The experience shows that this approach relies on intralingual, experiential and implicit teaching and learning techniques. In addition, extension is done through a range of exercises using dialogue making, discussion, role-play, and various forms of opinion-gap and reasoning-gap activities, and grammar discovery activities.

RATIONALE

Another benefit of a quality education in science perspectives is in the fact that it could contribute a lot to developing ways of thinking which is now very crucial not only to Kazakhstani higher education system but to secondary education system as well. Pozo (2008) claims that the ability of thinking scientifically helps students to develop new ways of thinking, moreover it widen and deepen students' capacity to think. In addition, science education gives an opportunity to students and people to experience the delights of science and to feel part of it and have access to an appropriate scientific and technological culture as well.

To increase students' scientific or professional English in the Institutions of higher education in Kazakhstan to have value to foreign language learning and teaching besides the basic discipline 'English Professional' for MA and PhD students additionally the subject 'Profession-Oriented Foreign Language' is included within standard document of Ministry of education and science. This approach is attached to the idea to increase its scientific and professional activity and, above all, improve the quality of science education at all levels as a way for the higher education system to overcome the gap between General English and Academic or Scientific/Professional English and their learning and teaching strategies weaknesses as well. Due to globalization and internationalization issues we have understood the necessity of this action and that all scientific and research literature is written in English,

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and in this context particular attention should be paid to developing the scientific and technological education of our young generation. It is well-known, that scientific or professional English language has specific demands. It requires an extensive professional vocabulary to be learnt. For instance, challenges facing society, such as energy, genetics and climate change are of great interest for a variety of people. The implication from this is clear and to provide students interest in science, English practitioners include such topics to be discussed within their syllabuses and curriculum to develop students' speaking, listening, writing and reading abilities and skills along with their thesaurus development. Based on our experience of teaching Professional English and Profession-oriented English to MA and PhD students of non-language majors in home Universities we have noticed that in many cases students have difficulties to express their own thought by arguing, describing or explaining some technical processes or devices, as well identifying ideas in written form due to grammar and vocabulary lacks. It is much easier to them to simply perform pre-, while- and post-reading tasks after reading the text relative to their specialty such as energy, economics, biotechnology, computer science, etc. In other words, it is easier for them to use the language expressions and terms taken from the text but not to produce their own discourse text which hints to their weak language exposure or lack of speaking and writing skills. For instance, at the end of each studied unit in the textbook students have to consolidate their knowledge by activating their prior knowledge while writing an essay on the given topic. The analysed essays show students' problems with grammar in discourse and vocabulary, i.e. weak linguistic competence. In other words, students could not evaluate their thoughts and feelings and have difficulties to working with ideas rather than transmitting information. As Marquez Bargallo y Prat (2010) claims, students could not interpret scientific investigation of their own ideas, on science topics related to ongoing, current scientific issues of the day as well.

To help students to overcome the abovementioned difficulties we have defined the effective teaching methods and learning strategies in the context of content-based approach to consider such kind of tasks where students could discuss in pairs or small groups by absorbing, categorizing and comparing, identifying main ideas and relationships, inferring and predicting as well while working with authentic texts and textbooks. In addition, we ask students to formulate good questions and hypothesising, describe some events with drawings to amplify the communicative level. Then, comparison/compare tasks doing to teach students to establish events and their relationships. In addition, justifying tasks to teach students to explain why and because, i.e. commenting the events happened in the text or mass media by using scientific vocabulary in context, i.e. understanding cause and effect, making inferences.

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Finally, argumentation skills developed would allow students to argue or discuss the proposals or topics by reasoning and responding in specific context including drawing conclusions and communicating results.

We strongly believe that to develop a more realistic understanding about the nature of science and how it operates practitioners have to share knowledge, connect with other curriculum subjects and with the lives of students in and out of university and their communities. In addition, globalization and internationalization challenge students to acquire an active repertoire of generic and specialist competencies which are a cornerstone of higher education system in Kazakhstani universities now. In its turn this requires new evaluation of students' success which will be measured in terms of their range of knowledge and namely science education will be a key element in the development of these new competencies.

To meet these new challenges students are taught of taking a content-based learning and an enquire-based approach. Through science-based authentic texts students are taught to define, refine and resolve problems and ideas. They will be prepared to develop their powers of logical reasoning and abstraction. In addition, they will be given materials to stimulate their thinking and prompt scientific questioning which lead to students' understanding and learning science concepts along with developing students speaking and technical papers writing to present them in international conferences or seminars.

Considering the abovesaid, we are currently designing a module (see Table 1 below as an example) to format different competencies which could be chosen afterwards in each area and teachers are certain to embed and implement them in their syllabus or curriculum or they are not confident so that need to be developed. Aitken (1998) states that competencies are 'the technical skills and professional capabilities that a teacher needs to bring to a position in order to fulfill its functions completely'. Further, these competencies can help the teachers understand the main theoretical areas of a discipline and critical awareness of current issues and problems to make a right decision. Next, constantly working at improving their performance and competency skills, teachers can be aware of their strengths and weaknesses and their progress as well which in its turn to help them to monitor students' progress. Also, the lack of relevance of the science and technology-based curriculum is probably one of the most important drawbacks for effective learning as well as for interest in the subject. Finally, teachers will be able to exercise independent initiative to make complex decisions and to create their own knowledge with regard to what works in the classroom as well as to which strategies have greatest impact upon students' learning.

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Table 1: Model of professional competencies formation within LLLL in science perspectives

	What I did (&TEAP competence area)	Why	What I learnt from this	How I can use it / further research action
Academic contexts	-raise awareness of the academic needs of students -raise standards of the achievements in academic literacy, information communication technology (ICT), -academic communication and problem-solving	-build on their existing skills and aspirations -use real, authentic texts in the classroom -develop contextualised communicative skills	-recognise students needs and interests, motivation -identify students academic literacy, ICT, academic communication and problem-solving as crucial and resource for addressing them in the teaching	-What academic and cultural activities could help us approach teaching academic vocabulary more effectively? -How can we put academic literacy into practice to be active in the support of its ongoing development and implementation along with identifying ways of improving the range of ICT skills, academic communication and problem-solving?
Disciplinary differences				
Academic discourse				
Personal learning, development and autonomy				
Student needs				
Student critical thinking				
Student autonomy				
Syllabus and programme development				
Text processing and text production				
Teaching practices				
Assessment practices				

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Thus, through science –based professional English lessons students should learn to search for information from a variety of sources from the first-hand; to sort and classify; to explain their findings; evaluate the outcomes of such investigations, and suggest new opportunities for future investigations. It goes without saying that such approach to learning requires a change or consideration in the way that many teachers go about their work. It should be first of all students-centered learning, strictly following to the requirement of students-talking time

(STT) and teachers-talking time (TTT). If we could meet basic learning needs, learning across the ages, teacher training and development, understanding learning strategies in communities and research societies, the learning process, and the use of cutting-edge technologies in lifelong learning, then the teachers could be involving into action research to promote further their continuing professional development to become an experienced teacher or expertise.

Using an inquiry-based pedagogical approach to teach and learn English in science perspectives requires not only students' development and successiveness but an intensive teacher's development as well. That is why the abovementioned model considers both perspectives and help to emphasize not only competencies but also experimentation and practice-based approaches to teaching and learning Professional English or Profession - oriented English in science perspectives as well.

To summarize, it is worth noting that developing mechanisms for integrating lifelong learning perspectives, CPD in particular, could help both teachers and students:

- Plan, integrate and take responsibility for their personal, professional and academic development, identifying learning/teaching opportunities within their own academic courses and extra-curricular activities;
- Recognise, value their learning and development both the curriculum and inquiry stance to be more aware of how they are learning and what different teaching and learning strategies are trying to achieve;
- Be more effective in monitoring and reviewing their own professional progress and action research and using their own portfolio of learning to demonstrate to others what they know and can do;
- Evaluate and recognise their own strength and weaknesses and identify effective ways in which perceived weaknesses might be improved and strengths enhanced;
- Develop their identity in relation to their academic, professional and personal progression;
- Develop an academic or/and professional vocabulary to communicate their development and achievement.
- Be better prepared for the demands of continuing progression in professional and academic careers.

Thus, English teachers have to teach students on science-based materials where science is taught and learned in contexts in which students can make links between their existing knowledge, the classroom experiences, and the science to be learnt. This could help students

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share, develop and extend their experience to take them beyond their immediate environment. Further, the students could be engaged in thinking about their own and other's thinking, thereby developing a metacognitive awareness of their own present thinking and the way of how they learn. It is worth of noting here that the more students will be involved in their content-based tasks the more the outcomes progress, provided that these tasks are comprehensible and adapted for students and of small groups or in pairs working together. In other words, without well-designed materials and teacher well-trained in the abovementioned approaches it is always difficult to match practice with rhetoric.

CONCLUSIONS

To Binton, Snow and Wesche's (1989:2) opinion the content-based approach is the concurrent teaching of academic subject matter and second or foreign language skills because it aims at teaching and learning of content and meaning by using the target language. Moreover, we support Lightbown & Spada's (1993) idea, that content-based learning promotes negotiation of meaning, which is known to enhance students' language acquisition, in other words, they should negotiate both form and content. In addition, content-based learning allows the flexibility in designing the curriculum and activities because there are more opportunities to adjust to the needs and interests of students. On the other hands, the integration of language and content could erase sides between basic language study vs. specialized literature and cultural studies often exist in university language departments.

The rationale for professional English or Profession-oriented English in science perspectives has four dimensions. The first dimension is that lifelong education and/or CPD in science perspectives could help to reduce inequalities and benefit postgraduate students to participate fully as citizens in multilingual perspectives. The second dimension is that lifelong education and/or CPD could develop students' abilities to think within and beyond science which benefit students to acquire a valued and be a part of culture. The third dimension is in the fact of students' competitiveness in the international labor market to choose a wider range of careers to be financially and personally enriched. The last one is increasing globalization and internationalisation which much contribute to students' preparedness to achieve their potential and change their worlds for the better.

To conclude we can state that teachers, curriculum development, materials selection and students need to work together to find the right content and tasks which ensure suitable levels of required English proficiency acquisition.

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Linear Analysis Of Latin Origin Turkish Alphabet (Script Italic Hand Writing Example)

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Abstract
It is especially important during the first class that the teacher knows the subject well and has the necessary skills to apply the alphabet both on the board and on the student notebooks. Writing success is increased if he/she shows the anatomic structures, line spacings and guidelines using colored chalks on the board. Similarly, applications on the student notebooks also enable reinforcement. The linear classification of letters is especially important during the writing courses at education faculties that educate teachers. The status of each is important for the classification of upper and lower case letters. Alphabet will be examined by way of drawing as well as explanatory expressions by classifying letters as slanted, wavy, curvy letters due to their anatomic structure, letters with curved lower extension, letters with round bend on the line, letters with a bowl, 'S' letters, letters with dots, letters with similar anatomic bodies, letters with extensions towards the top or bottom, letters with flat starts etc. Thus, teacher candidates will gain the sensitivity of artists with a wide field knowledge and application regarding letters which are the fundamental elements of writing. The proper and effective learning of the alphabet by the teachers will contribute to the education of students in the future.

INTRODUCTION

The start of script architecture is based on the linear evolution of the individual when he/she takes a pencil in his/her hand for the first time. Skills increase with each new line drawn and slowly but surely a linear construction begins. Phenomenon that are thought to be unchangeable are written down on the paper. The first figure is the figure of man. The drawing of the first figure starts with the human head and the drawing of the complete figure is structured completely around the primary school period. Since each individual starts both drawing and writing stages in the same way, they also accept to know the field of script as well. Even though every stage of one's life passes with script, the limits of writing are generally what the teachers teach and is proportional to the curiosity of the individual. Thus, the knowledge related with script culture is limited and very superficial. A generation with writing that progressively gets worse which is losing its interest towards the act of writing has come about in the age of information technology (with the use of smart phones, Ipads, computers etc.). Happy individuals who gain respect thanks to their good script is now in the minority. Individuals who do not give importance to the act of writing or who do not find

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writing valuable also do not give value to the concept of beauty. The individual can put forth a good form of writing if he/she carries out the organization, structuring and construction of the letters which are the most important elements in the formation of script culture in accordance with aesthetic rules. However, a widespread attitude has not developed related with beautiful script. Yet, education starts with the writing of the letters in the alphabet and is developed based on this foundation.

The sensitivity of individuals towards writing can be increased if they are fed continuously with the concept of "beauty" which is then reflected in their lives (memories, dreams etc.). These actions will reflect in their lives if the individuals can design and concretize regular letter structures. Thus, their tastes will develop by recognizing good script. Awareness will develop by knowing that only beautiful things can exist in a beautiful culture environment. The eye-memory relationship in the visual sense will affect the nature of the individual thus leading to permanence.

Letters come together to form words, words come together to form sentences and sentences come together to form text and thus the design of a page. These structurings will enable the individual to develop himself/herself during each advance in class. The individual will feel happy if he/she puts forth a good script culture on the page. The individual will have created his/her own script architecture with the writing formed by using the letters on the page.

If the sentence, "Good handwriting is a privilege" is engraved in the minds of students starting from the primary school, sensitivity towards every field in life increases. Pages with good designs can be formed by more attentive writing instead of using bad looking, scrawly letters. It should not be forgotten that the element of beauty cannot be found on pages where letter rules and scale deformation increases script pollution. Beauties that spread from the inside out will increase as letters establish healthier relationships with one another. Awareness is possible when the network of meanings inside the relationships in our lives increases with the balance of good and bad script thus consciousness can be reached. The values that come with script culture contributes to the organization of social living. Script gives identity and personality and the aesthetic tendencies tend to reflect towards the outer world.

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PAGE ARCHITECTURE

The individual that is reflected on the page with letters combines with every element to become a whole. What is important in the letter-structure architecture on the page is that there is an artistic dimension as well. The intended script text comes to life with the technique of the proper materials (pencil, pen, fountain-pen etc.) used in the formation of the letter-structure architecture. The fact that the design architecture of the page gains on an artistic quality depends on the use of propert artistic principles as well as fundamental design elements. The writing of letter anatomies in an orderly and correct manner is based on the relationship of the skill level of the individual with the action technique. Letters, sentences and the arrangement of the spaces between lines are important elements regardless of the material and technique is used for letter anatomies. The spaces left affect the design of the page layout. Because letter anatomies, pencil pressure, spaces between letters-sentences-lines make up the texture of the page layout. In addition, the size and proportioning of the letters also affect the aesthetic of the page. The architecture of the page design has two dimensions: the aesthetic element that appeals to the eye and the content of the text that appeal to the mind. The positive-negative judgments of the viewer regarding the page depend on the positive-negative application of design elements and principles. The individual can act freely while designing the page. He/she can take a new page and start afresh when he/she does not like the result. Individuals who are good in script culture do not have a hasty letter structuring. Because since visual discipline is attained, the mental activity is actualized by proportioning it with handskills. Thus, script culture and etiquette gains importance in writing. Individuals who undergo schooling bring in reality to the script culture by imposing beautiful elements.

The fact that even the simplest, most basic letter should not be rushed but should be written down and arranged in the style of an artist has to be thought during primary school years. If this works out, it will be realized that good writing is possible anytime and anywhere. The unity of the spacing between letters as well as the unity between the words and sentences on the page together create an integrity. Each factor, every item is an element of aesthetics. When the harmony of each item is combined with handskills, writing flows. However, writing based on rules may not always appeal to the senses even if all the rules are met. The viewer may be disturbed of an excessive use of rules on the page. The script reflects the style and attitude of the individual. The page size (A3, A4, A5 etc.) and the ratio of the letter scale and proportion should be aesthetic. Narrow-flat letters, tall-short letters; in other words, each letter which is not suited to the dimensions of the page is out of scale. Ratio is a mathematical

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relationship that exists in the relationship of the letters between themselves. Whereas scale is the relationship that letters form with the page. Letters grow in size along with the page and thus the pencil scale also gets wider. As the paper gets smaller, pencil scale becomes thinner and smaller.

LETTERS AND SYMMETRY

The main attribute of the anatomic structure of letters is the existence of the element of symmetry. It is appealing to the eye when the appropriateness of the symmetry establishes an order. "What we seek in symmetry is the similarity between the dimensions, shapes and status of more than one part or element. The repetitions of these similarities prove the existence of symmetry. Geometric structuring that is fundamentally based on the similarity of shape and position puts forth a mirrored appearance. A mutual balance is formed. Designs are not made complex and incomprehensible since they are designed to be appealing to the eye. The special script of calligraphy is known in our society as 'mirror writing' as well. (Özer,2010) Indeed, the use of uppercase and lowercase letters (similar ones are c-ç, g-ğ, o-ö, s-ş, u-ü) together in some sentences is known as twin letters and comprise symmetry as well. For example; anne, bakkal, bıkkın, elli, faal, fiil, hakkı, hisse, kıssa, matbaa, millet, saat, sessiz, şeffaf, şiddet, yuttum, zimmet etc." The internal consistency of letters comprises their similarities. The individual should give proper attention while writing when two of the same types of letters are side by side.

"First of all, balance is seeked in symmetry. Balancing is defined by the elements or words. The act of balancing requires learning and understanding. The human mind seeks balance rather than imbalance and this balance is expressed by symmetry. Since symmetry also forms a balance in the mind, it enables the balancing of mental functions and operations as well. A symmetry is in place in the cave metaphor of Platon between the real and the abstract world. The equality relations are symmetrical. In addition, the asymmetric uniformity of the shapes move the design towards a certain rhythm as well. 'What is human life? Another reflection of God' says Hölderlin, thus stating that the existence of the sacred within the universe and what is contained in the universe reflects as a harmony. This reflection is symmetrical. No doubt that the symmetry of the person within himself/herself can be accepted as the fundamental point of seeking and finding symmetry everywhere. Adjectives exist with their opposites in language. The axes that pass through the center points of these opposites enable a dialectic with their symmetric structures. For example, the axis that passes right through the words

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beautiful-ugly, put forth the symmetry of beauty and ugliness. Axis means a line that divides an object into two equal parts and as a word it is the symmetrical axis of being neither beautiful nor ugly." (Özer,2010) "It is certain that symmetry is an arrangement that creates feelings of unity and wholeness. (Kuban,1990)

RHYTHM IN LETTERS WRİTİNG

Rhythm is an important design tool in writing. The repetition of various elements such as symmetry, line etc. enable a flow in writing thus creating a rhythm. Especially, the connecting lines of script italic handwriting provide a feeling of rhythm and create further design possibilities. The skills and knowledge that the individual gains throughout his/her education contributes to their development by forming a level of awareness. The letters of the script he/she learns is neither what the MEB (Ministry of National Education) nor what the teachers taught. Fundamentally, it can be stated that the letters he/she writes down comprise the reality of the individual as expressed by himself/herself. In order to attain the continuity of good writing, information of the past should be internalized well so that they become information of today and tomorrow as well. It is not correct to say I somehow learned writing, I know how to write, it is enough for me, it can be read or what can I do this is how I can write. Efforts should be given by warning those with sloppy writing that gives no aesthetic pleasure. Letters, words and sentences come to life on the empty silence of the pages with an awareness that they are the part of a whole; thus the words and sentences create rhythm and harmony. Whereas reading-writing continue simultaneously in the first year of primary school, the skill of writing starts to lag behind after that. Reading comes to the fore. Because the student holds the pencil too tightly when writing, he/she gets tired easily, is not happy and feels too lazy to continue; hence does not like writing. That is why the individual gets a stance against writing and a prejudice develops.

LINE COMPONENT

"The line has been the first means of expression of humankind. Writing used by first humans as symbolic representations of the sounds used for communication following the language of drawing is the best example." (Abacı, 2007) "The most fundamental element of art, the dot, lies in the depths of the soul of mankind. The dot is the start, it is a trace with means of movement and it is also an end. The dot has no width, length, height or volume. The dot transforms into action thus forming lines and its derivatives. The line is a border that determines the shape of an object that surrounds and encompasses it. The line can be

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classified in three groups as straight line, broken line and curved line. For example definite, indefinite line, significant-insignificant line, regular-irregular line, thin-thick line, colored-no colored line, valid-invalid line, line with border-without border, arc line, hollow line, rotating line, wavy line, consecutive line, simultaneous line, broken line etc. as well as the proportions of the line and the dependency relations show the infinity of the world of lines." (Özer, 2010, p. 3619-3620) The journey of lines and its derivaties that are learned during the primary school years continue throughout our lives. "Line is a plastic and geometric concept and is a tool that makes up the foundation of painting. Infinite types of lines can be found using different materials and tools. The line is the foundation of expression as well as its starting point and element of balance. In short; lines are the main tools of the activities of mankind unique to it. The organization elements of a work of art have separate fundamental groups. Line is the basic element that binds and initiates these elements."(Yolcu, 2004)

"One of the theories of 'beauty' used is the golden ratio. LEONARDO DA VİNCİ and the Astronomer Kepler have carried out many etudes on the "golden ratio. Accordingly, the ratio of the small part of a whole that is divided into two unequal parts to the large part has to be equal to the ratio of the large part to the whole." (Gökaydın, 2002) The linear harmony of the letters in the alphabet is balanced. In addition to the exercises that support the visual perception of the students, their aesthetic sides are also enhanced by making them to form relations with the drawing lines of letters. Thus, an individual quality is attained by making the analysis and synthesis of letters in a conscious manner. The similarities as well as the symmetric lines in the writing of letters (uppercase or lowercase) take on a systematic form through repetition thus a certain discipline is formed. However, it is a prerequisite that the individual senses the linear relationships during the learning of letters. The student actualizes a concrete reflection of his/her knowledge and intelligence through various repetitions as well as intuition.

THE CASE OF VISION

The action of writing is a multidisciplinary field. It is important and has priority since it forms the basis. Scientific disciplines are invigorated through writing. "Another element that is stipulated in this field is that the act of seeing should have gained a multidimensional quality. The act of seeing has really become something more than a sense that only mechanically records what we see. Matisse points out the most important attribute of the act of seeing when he states that 'seeing is not only a physical function, we see with the power of our thoughts as well' (Gökaydın, 2002). In addition, the painter Leonardo da Vinci has also

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said, “Learn to see. You will realize that all is connected.” Success in the act of writing is only possible via the education of seeing. It is true that the forms, ratios, scales of letters in writing are primarily related with the act of seeing and that seeing affects application as well. The connections between seeing and internal – external world form an organic whole together with the alphabet systematic. The similarities-sameness between letters, symmetric elements etc. appeal to the thinking and perception areas together with seeing. Writing and thinking gets moving and thus action occurs.

The letters in the alphabet are made up of curvy lines and different types of lines that make up the anatomic structure. They comprise a whole according to the page layout and are perceived as such. “Perception is defined as giving meaning to the objects and events around us by combining our sensory data and interpreting them. (Cüceloğlu, 2002). As can be understood from the definition, we need to have senses in order to form a perception. Hence, we need to have a functional eyesight so that visual perception can occur. The perceptions and senses of humans should be perceived as two separate elements that complement one another even though they work together. Cüceloğlu (2002) defines this difference as such: “Perception is different than sense. At the moment of perception the brain takes into account the expectations of the individual, the past experiences, data from other senses as well as social and cultural factors. It is at this stage that some of the incoming sensory data are selected, some of them are omitted, some of them are enhanced and blanks are filled to provide a meaning.”(Tuna, 2009)

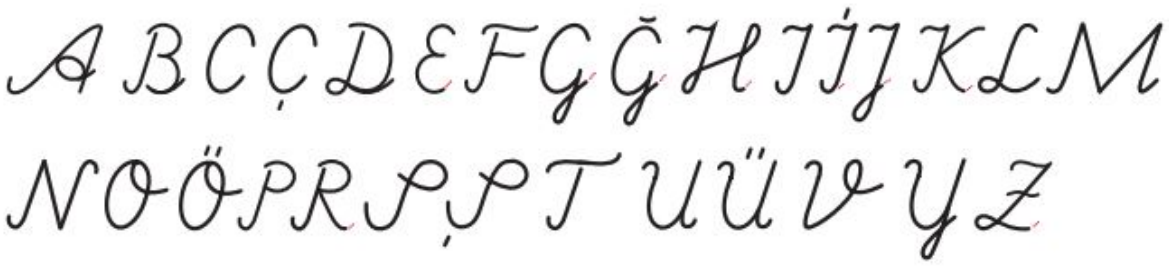
Letter forms are in a relationship that puts fort the attributes that are suited to the character of the individual according to the reflection of the own lines of that individual. There might be traumatic approaches that disrupt the anatomic structures of letters and make the functions of writing turn into a failure. Physical (material) or psychological (spiritual) approaches might also affect the writing action integrity during the act of writing. Abstract elements might reflect on the page, findings might emerge and the relationships are understood by the teacher by establishing causal bonds. If the individual does not like his/her teacher, he/she will deliberately do the opposite of what the teacher means by saying ‘that letter will not be written like that’.

“The human body comprises a whole together with the skin, the skeletal system and the soft tissue and other organs, nerves and veins that this system encompasses.” (Gök, 1978) The letters also have anatomic structures just like the human body. The anatomic structure system

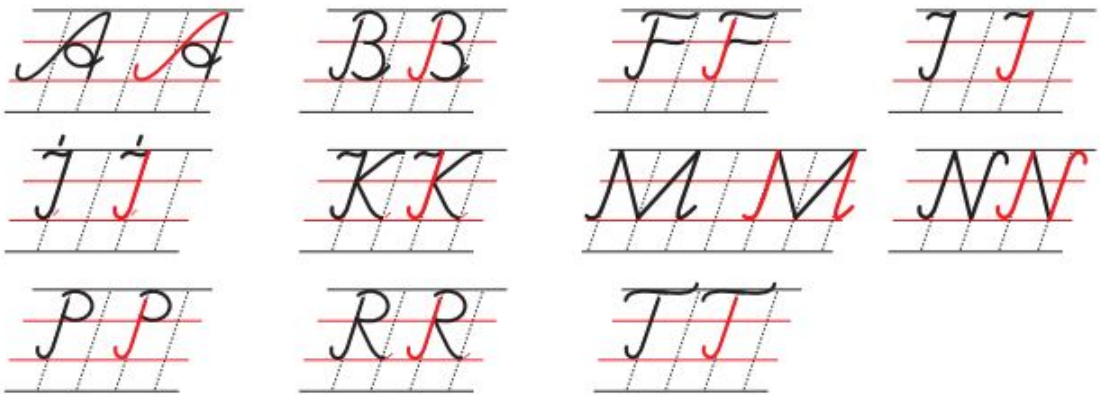
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of letters is an ellipse in script handwriting and become visible as soft-hard, printed-unprinted etc. depending on the personality of the individual. Letter information and the skills of h olding a pencil combine to form an architecture and a melody as well as a rhythm on the page. The main body in the anatomic structures of letters is an ellipse and it is located on the 2nd-3rd line and the 1st-2nd guideline.

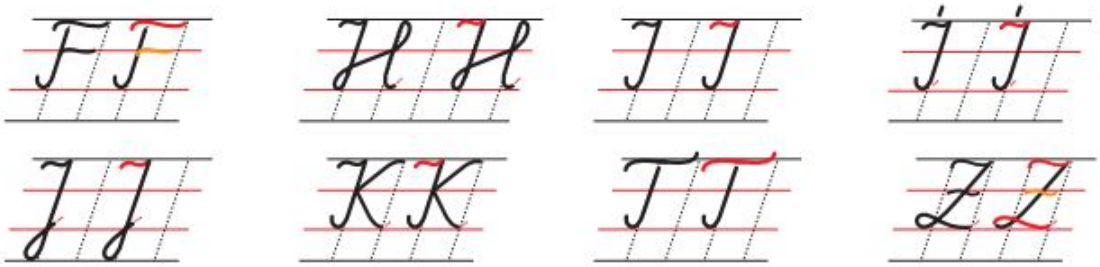
The linear analysis of script italic handwriting is given below for upper and lowercase letters:



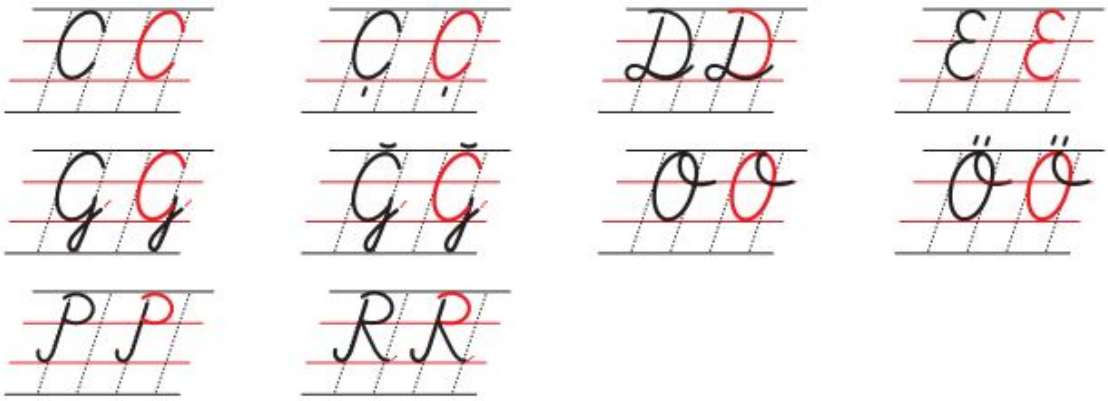
* Eğimli ve ucu kıvrımlı harfler



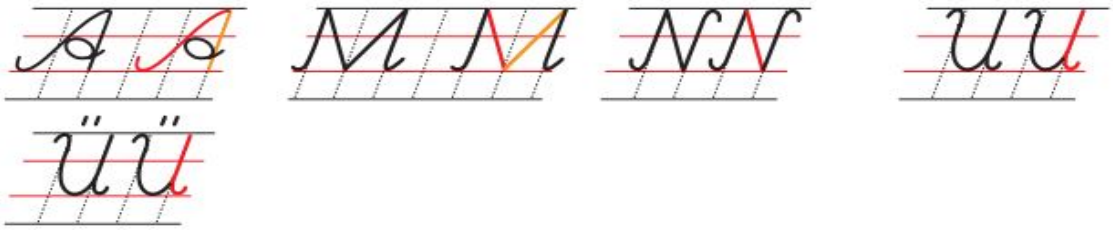
* Başlangıcı - orta - son bölümleri dalgalı olan harfler



* Kavisli (sağ-sol) olan harfler



* (Sağ-sol) Eğimli olan harfler



* Çanaklı harfler



* "S" olan benzer harfler

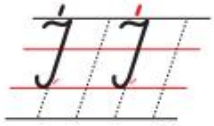


* Alt uzantıları benzer olan harfler






* Noktaları benzer olan harfler




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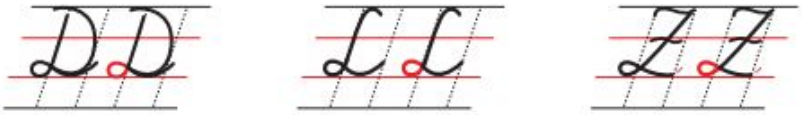
* Üst satırda bombesi olan harfler



* Bombesi ortada olan harf



* Satırda bombesi olan harfler



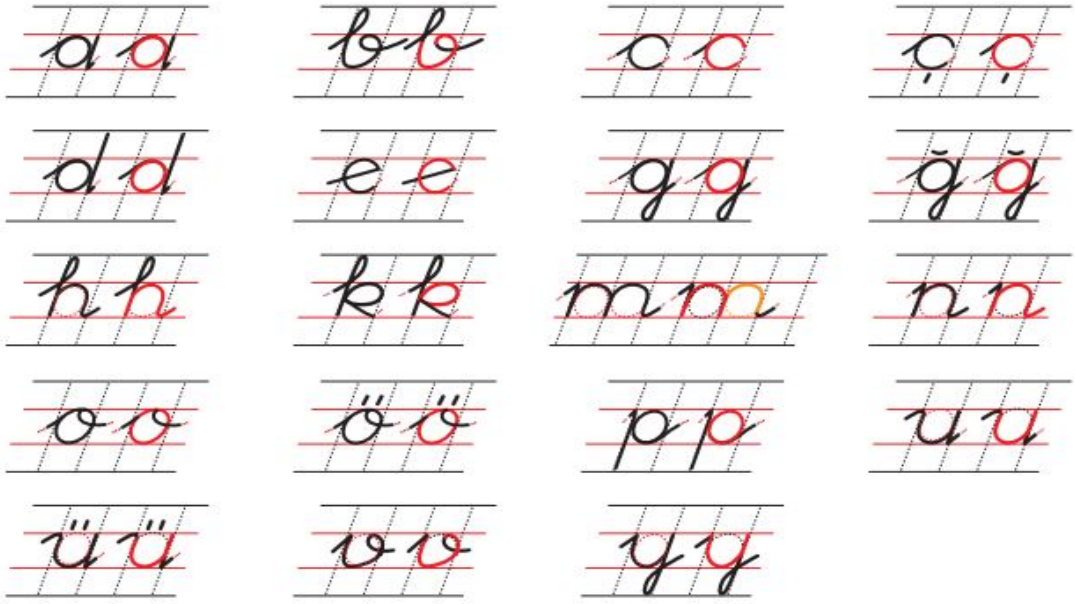
* Bombesi içte ve dışta olan harf



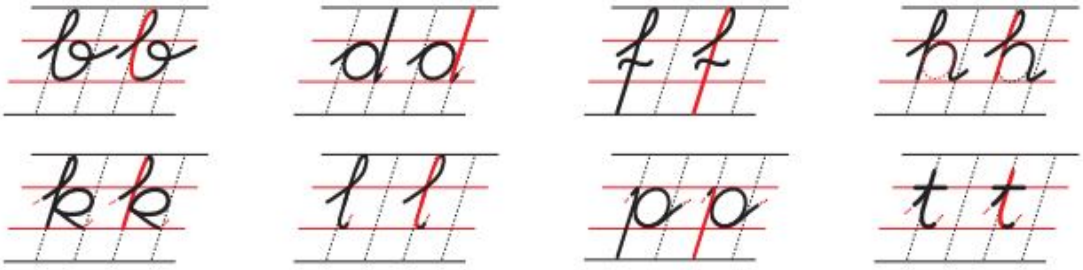
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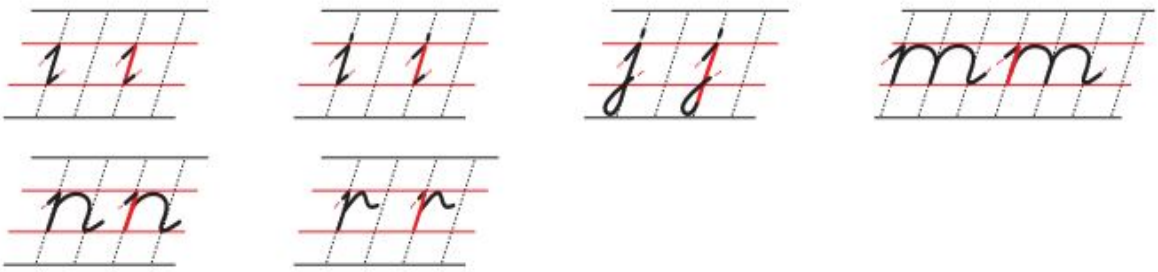
* Anatomik gövdeleri benzer olan harfler



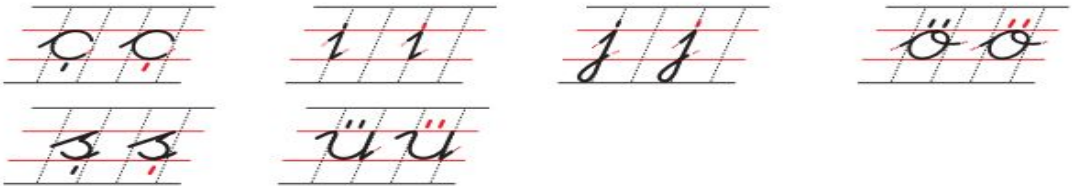
* (iç-dış) yapıları dik olan harfler



* Başlangıçları düz olan harfler



* Noktaları benzer olan harfler



* (Alt-orta-üst bölümleri) Dalgalı olan harfler



* Üst uzantıları benzer olan harfler



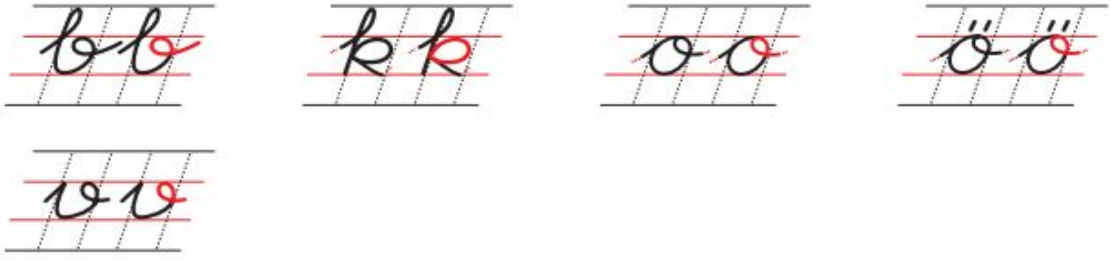
* Alt uzantıları benzer olan harfler



* "S" olan benzer harfler



* Bombesi ortada olan harfler



CONCLUSIONS

It is beyond any doubt that much more attentive and readable handwritings will be written especially with the alphabet line analysis awareness of teachers and teacher candidates. Handwriting course is a multidisciplinary field. It is important and has priority since it lays down the foundations. It is also important to work on the aesthetic dimension after writing is learned. It should find the place it deserves in education.Every student can write in an aesthetic manner with an effective and sufficient motivation since it has continuity and succession. Thinking always occurs during the act of writing both regarding the content of the text and regarding the page layout. Hence, the activeness and action of thought in the general sense becomes concretized in writing.

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Multimediality And Interactivity - Traditional And Comtemporary Perception

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Abstract
The use of information and communication technologies in education is a widely discussed topic, not only in the teaching community. The use of these devices manifests itself in the development of multimediality and interactivity. The concepts of multimediality and interactivity are not new and they have their predecessors in both pedagogical theory and practice. Multimediality can be understood as the fulfilment of the principle of clarity, which was formulated as early as by Comenius. Likewise, interactivity is based on the need of communication and interaction in training.
However, modern information and communication technologies allow broader application of these principles, because multimediality and interactivity are endowed with features that can significantly predetermine the quality of education. It is also possible to observe some significant differences in traditional and contemporary understanding of these concepts. Some of the most important differences, defined on the basis of theoretical analysis, are introduced by the submitted essay.

Introduction

Nowadays, we come across the terms of media, multimedia, multimediality, interaction, interactivity, and interactiveness very often. It might not be such an exaggeration to say that if not multimedia or interactive, then outdated or obsolete. This somewhat biased, certainly quite simplistic point of view stems above all from technological and technical possibilities of modern information and communication technologies. The later are without doubt invaluable and offer many new incentives for pedagogical theory and practice, but they are only tools aimed at providing suitable conditions for the promotion of new and enriching traditional theories of learning. The two concepts in question and their traditional or contemporary understanding, which are the subject of the submitted paper, enable to demonstrate that multimediality or interactivity are based on the rules and principles known since long time ago, and whose aim was to improve the educational process.

Therefore, at least in the field of education and training, the above mentioned concepts cannot be considered as new, and it is possible to transmit their original, though enriched significance to today's world. The principles on which they are based have not been overcome yet, and in terms of modern information and communication technologies it is just easier to

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promote, transfer or reproduce them. Therefore, when speaking about "new" understanding of the concepts of multimediality or interactivity, we do not mean a change in the principles upon which they are based, but rather their enrichment by new ways of promoting them, which are based on the capabilities of modern information and communication technologies, and depend on the needs of the educational process.

Multimediality And Interactivity Within Educational Paradigms

From a pedagogical perspective, the new understanding of the concepts of multimediality and interactivity is related to the existence and development of the two most influential educational paradigms of the second half of the twentieth century, which themselves stem from two "big" theories of learning - neobehaviorism and constructivism (e.g. Průcha et al., 2009, Bertrand, 1998). An analysis of the educational paradigms helps to explain the position and role of ICT in different learning styles and thus understand the real, as well as expected or preferred ways of using modern technologies in teaching and learning.

The traditional education paradigm stems from the theory of systems and planning lessons and it reflects the ideas of behaviorism and neobehaviorism (Zounek, 2009, p. 78), which as far as technologies are concerned, highlight the concept of programmed learning. In contrast, the contemporary education paradigm, whose flagship is constructivism (social and cognitive), perceive the importance of internal assumptions for pupil`s learning, as well as the importance of the pupil`s contacts or interactions with the environment (Zounek, 2009, p. 79). The main concept of constructive learning is based on preconceptions (Doulík & Škoda, 2008) and is not aimed at complete knowledge, but at its construction. For the summary of the main differences of these two paradigms are shown see Table No. 1.

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Elements	Traditional education paradigm	Contemporary education paradigm
Role of the teacher	The teacher is the central person who conducts educational process	Facilitator, helper, and guide
Teaching style	Knowledge transfer, instructive lessons, checking pupils' work and feedback	Interactive or dialogistic approach to teaching. Adapting teaching to existing concepts and skills of students.
The role of the pupil	Passive role prevails. The pupil is controlled and his or her activity is necessary only at some stages.	Active and cooperative "creator" of knowledge, who takes responsibility for his or her learning and organizes his or her work as well.
Curriculum	Strictly defined standards and syllabi.	Based on projects and problem-based learning.
Learning	Receptive and reproductive, does not take place in a context and is based on the effect of external stimuli which affect both learning and behavior of the student. The curriculum is divided into small steps and the provided feedback supplies necessary firming.	Mainly a productive style of learning. Dialogue is important.
Learning objectives	Acquiring and retaining specific knowledge and skills.	Restoring, understanding, and making use of knowledge, cognitive flexibility, critical thinking, experience sharing, ability of reflection.
Teaching styles	Frontal teaching, but also individual instruction (when working with the program). Little variability in learning activities is typical.	Group work, project teaching, experimentation, synthesis of information, and presentation. Big variability in learning activities.
Teaching methods	Interpretations, explanations, study of textbooks, audio-visual teaching.	Discussing problems, managed discovery, active participation in solving problems.
Evaluation and assessment	Testing, marking, summative evaluation.	"Anything" can be a source - textbooks, books, magazines, audio or video recordings, internet, electronic encyclopedias, classmates, teacher, school, and/or external experts.
Sources	The main source is the teacher, or a precisely defined range of educational materials.	Performance tests, portfolios, generally formative evaluation, self-assessment, and peer assessment.
Role of technologies	Carrier of learning content, providing practice, revision, and feedback.	Informative, constructive, cognitive, communicative.

Table 1: Comparison of traditional and contemporary education paradigms (adapted from J.Zounek(3)).

It is apparent from the comparison showed in Table 1 that in both cases technologies supply the necessary tools and resources to promote the principles of both paradigms and help to develop them. While we talk about technologies in general, in case of the traditional paradigm they might have been represented by various audiovisual didactic resources and teaching machines, which, however, are now gradually being replaced by information and communication technologies. A good example of that could be the replacement of teaching

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machines by multimedia educational programs; slide projectors and overhead projectors by data projectors, and/or conventional whiteboards by interactive whiteboards and so on. (Dostál, 2009a, p. 20-21).

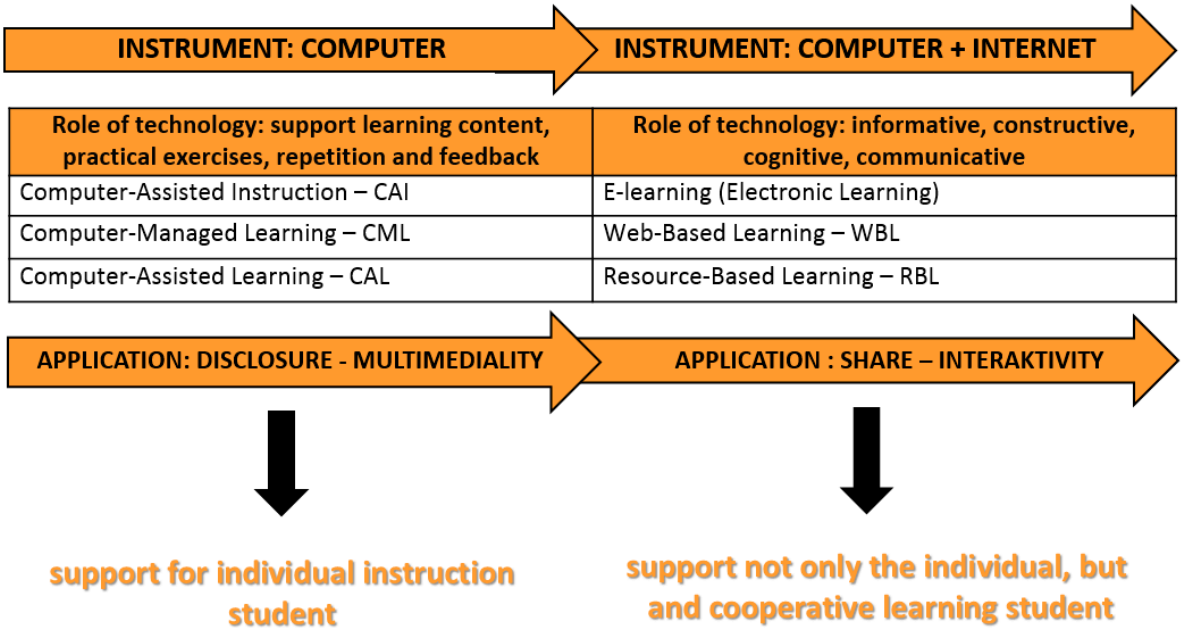
From this point of view, information and communication technologies therefore occupy an important position in both the aforementioned paradigms. In the classical paradigm, the multimedia capabilities, such as the one of the carrier of the learning content are used, whereas the contemporary paradigm makes use of ICT ability to establish, maintain, and develop communication and interaction in education.

DEVELOPMENT OF CONCEPTS REFLECTING THE USE OF COMPUTERS IN EDUCATION

Information and communication technologies (or more precisely computers), have enriched training by many crucial suggestions or applications (Jandová, 1996). Although the core of the submitted paper lies in the definition of traditional and contemporary understanding of the concepts of multimediality and interactivity in education, it is necessary in this context to pay attention to the individual concepts related to the integration of the technologies into education as well. The very fact that the later took place in a time when computers were only slowly reaching public awareness enables us to document the development of the conceptual understanding of multimediality and interactivity in the traditional and the modern sense, based on the development of concepts reflecting ICT in education.

As mentioned above, computers introduced into training many crucial incentives and applications. That of course did not happen suddenly, but has undergone specific development stages. Gradually, several concepts of possible uses of computers in education were established (Zounek, 2009). There is no need to analyze them in detail; on the contrary, it is important to view them as a whole, divided into two schools of thought, which are shown in the following Picture No. 1.

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Picture 1: Concepts reflecting the use of ICT in education

According to the aforementioned concepts, which to some extent overlap each other and of which the newer are always enrichment of the older by new tools and application possibilities, information and communication technologies play four basic roles within the training process (Zounek &Šeďová, 2009):

- They are carriers of the learning content that comprises not only texts or hypertexts, but also images, animations, photos, videos, and audios.
- They are communication tools which besides communication can also support cooperative forms of teaching.
- They represent a source of information used by pupils and students when learning, not only in classrooms.
- They can be used as creative tools or environments.

In this context, it is also possible to trace the evolution of both concepts, which are the subject of further text, in both the traditional and contemporary sense, which correspond to the educational needs of the given time period and to the technical possibilities that technology offers or offered at the particular time. First we shall treat the notion of multimediality, trying to define its traditional and contemporary perception. We shall apply the same procedure with respect to the notion of interactivity.

FROM CLARITY TO MULTIMEDIALITY

"*Let it be a golden rule for teachers that everything be demonstrated to as many senses as possible. Objects visible by eye, audible by ear, smellable by nose, tasteable by mouth and*

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touchable by touch, or objects perceived by more senses at a time should be consequently demonstrated to more senses." (Comenius) (Komenský, 1958)

Should we explore the concept of multimediality further, the golden rule formulated by Comenius, who thus expressed one of the important principles - principles of clarity (Roubal, 2009), must not be omitted. Contemporary didactics perceives as essential the unity of sensory perception, active thinking, and activities of students. From this perspective, it is possible to distinguish two kinds of clarity as they follow (Dostál, 2008, p. 28):

- Object (external) clarity – real objects.
- Visual (internal) clarity – verbal description of phenomena.

A very important factor in the use of clarity is the level of abstraction applied. According to E. Dale, abstract symbols and ideas are better understood (and thus also retained) when supported by a specific experience. His so called cone of experience depicts the relationship a teaching method or a teaching material used and the effectiveness of learning (teaching) (Riedl, 2004).

According to this model, the effectiveness of learning is at its height when related to real situations and real experiences of pupils (Dale`s cone`s bottom). Gradually, going up in the cone, man becomes more of a mere observer of reality which brings about a decrease in the effectiveness of learning, all that due to the applied learning method or teaching material. At the top of the cone there are methods which use only symbols representing reality, which of all the planes is the most difficult for students.

Traditional concept of multimediality

Originally, for example according to distance education principles, multimediality was understood as a set of tools which enabled a presentation of a subject matter and a mutual communication between the teacher and the pupil. Multimediality was thus perceived mainly as a way of using more devices to present the subject matter and to mediate communication with the student, which resulted in the developmet of these contatcs.

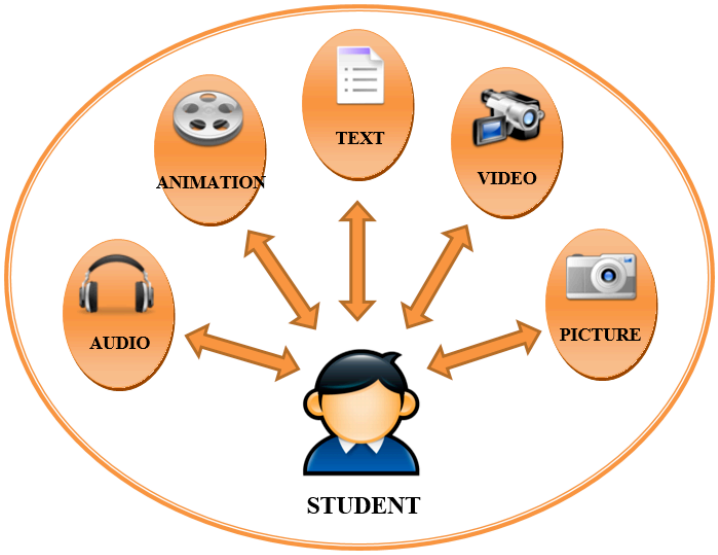
Oxford English Dictionary (1985) defines multimediality as "*denomination or form of artistic, educational or commercial communication, which uses more than one communication medium.*"

It worked on the assumption that it was necessary to ensure the transmission of the subject matter to the learner through as many various channels as possible, however, the fact that these transmission channels should carry the information of the same content, and stimulate

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more elements of the pupil's perception, was not accentuated (Dostál, 2009b).

The quality of the transmission media did not allow for a comprehensive combination of several media into one and also did not provide the tools necessary to ensure the relevant level of feedback, as shown in the Picture No. 2.



Picture 2: Traditional concept of multimediality

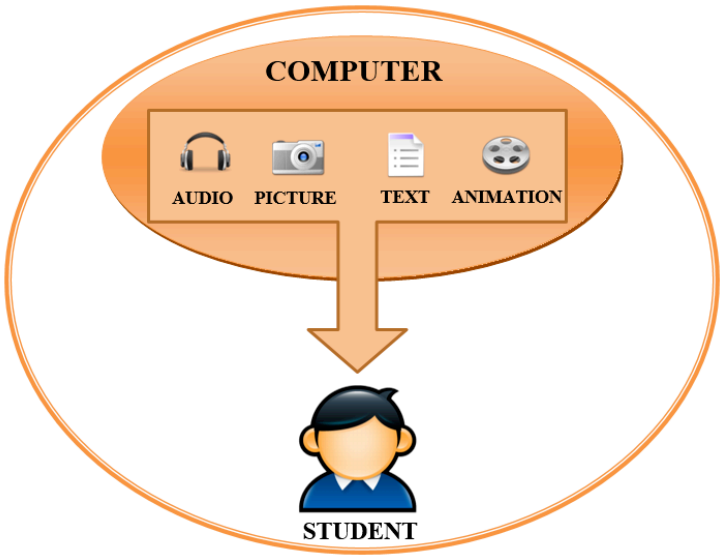
Contemporary concept of multimediality

Recently, due to a frantic development of ICT, the perception of the term multimedia or multimediality has been modified and extended, and is now understood not only as "technology", but also "scope" (Klement, 2011).

"*Multimediality is the interconnection of various functions which can provide media (text, images, graphics, animations, simulations, and so on.). The role of the computer is the one of a combiner of these functions which results in a multichannel mediation of information.*" (Brdička, 2003)

We can thus designate a learning object as multimedial if it integrates various document formats, or data (for example text, tables, graphs, animations, images, sound, video, and so on.) which intermediate or imitate reality, make for more clarity, and/or facilitate teaching (Dostál, 2009b). The integration is implemented exactly thanks to information and communication technologies, during both their preparation and presentation, and possible sharing. This concept is demonstrated in Picture No. 3.

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Picture 3: Traditional concept of multimediality

Therefore, the terms of multimedia or multimediality are currently understood in a much broader sense than just means of presentation of the subject matter or means of communication. In this context, it would be more appropriate to use the term "multimedialization of information" (Nielson, 1990), which is closely connected to the concept of "hypermedialization" of information. Therefore, the concepts of "new media" or "hypermedia", which can be simply defined as quaternary, network or digital, are often used. They are based "*on digital, that is to say numerical data processing*" (Macek, 2002), and ICT technology that enables the production, storage and recall of these media.

The new definition of multimediality, sometimes referred to as hypermediality, is thus based on the use of up-to-date modern information and communication technologies, and delimits its character as programs "*that facilitate different ways to access more information." Hypermedia are thus understood as systems of various media controlled by computer which not only provide a variety of sources, but also a variety of forms of interaction.*" (Bertrand, 1998, p. 107)

FROM COMMUNICATING TO SHARING

"*And as human nature is active and enjoys hustle, in particular disorganized hustle, which enables it to create and recreate things, do not start teaching until you have prepared your pupil to an active participation.*" (Comenius).

It is obvious from the aforementioned quote that as early as in Comenius` times, the necessity of active participation of the pupil in learning and the consequent interaction with their surroundings were accentuated. According to this interpretation, interaction (from the

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Latin interactio or inter-ager, that is to say act between each other) means influencing each other, negotiating, affecting each other wherever the emphasis is put on mutuality and reciprocal activity, unlike unilateral, or causal impact. In terms of the educational process we talk about pedagogical interaction which takes place between people as individuals in a particular social environment where individual actors occupy different social roles (Průcha, Walterová & Mareš, 2009). It is characterized as a process of mutual influence of several personalities (parents, teacher, pupil, educator) within a particular educational environment (family, school, hobby groups, summer camp), aiming at a specific target.

Traditional concept of interactivity

An important tool of pedagogical interaction undoubtedly is pedagogical communication (Průcha, Walterová & Mareš, 2009). In the broadest sense of the word, communication can be defined as a process aiming at mutual understanding. If it takes place between people, we use the term of interpersonal (social) communication. Pedagogical communication is a specific case of social communication. It is bounded by time and space, its participants are given, the goals and contents of communication are established. According to P. Gavora, it can be defined as a mutual exchange of information between participants of the educational process which serves learning objectives. Within its framework, information is conveyed by both linguistic and non-linguistic means (Gavora, 1988).

Within the framework of the teaching process, pedagogical communication plays the following roles (Mareš & Křivohlavý, 1995, p. 25-26):

- it facilitates collective action of the participants or individual working groups,
- it mediates interactions of the participants in the broadest sense, including the exchange of information, experience, as well as motives, attitudes, and emotions,
- it provides both personal and impersonal relationships,
- it forms all participants of the educational process, especially the personality of students,
- it serves as means to carry out education and training, since the objective, curriculum, methods, and so on cannot act in the learning process directly, but only in verbal or non-verbal form,
- it constitutes each educational system, as it represents one of its main components, ensures its functioning, brings motion, evolution, dynamics into it, and maintains its stability.

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As follows from the above mentioned, the traditional concept of interactivity was based primarily on the use of pedagogical communication aimed at mutual exchange of information between participants in the educational process, especially via direct, that is to say personal contact.

Contemporary concept of interactivity

However, the contemporary concept of interactivity is to be encountered in particular in connection with new media, to which it is attributed as their property. From this perspective, it is possible to define the term "interactive" as "a *possibility provided to the user in order to facilitate interferences in processes and to observe the effects of these interferences in real time.*" (Lister, Grant & Giddings, 2003).

This term is also used within the framework of the theory of communication to describe human communication based on dialogue and "exchange of information". Similar to the previous definition of the term might be a somewhat narrowed down formulation by Hilf (1996), in which interactivity is referred to as "*a reciprocal effect between a human and a non-organic component, such as television, video game or computer.*" The level of interactivity is then qualitatively measurable on the basis of Laurel` s method of interaction variables (Laurel, 1993), they are as follows:

- frequency of the user`s interaction with the happenings in the device,
- importance as a degree of response that will affect the outcome,
- amount of options available to the user.

Interactivity, its consideration, identification, and measurement is quite an important factor, because it serves as a descriptor of how the user is participating in the happening within the system itself, and also as a determiner of how well the system is designed. In terms of the educational process supported by modern information and communication technologies, and considering the current state of technology, it is possible to distinguish two dimensions of interactivity.

Two dimensions of interactivity

The first dimension of interactivity is based on the possibility of manipulating the subject matter. This dimension enables a two-way communication and interaction between the student and the multimedia object or subject matter, conveyed through the multimedia object and vice versa. The communication element is thus suppressed and emphasis is put on the

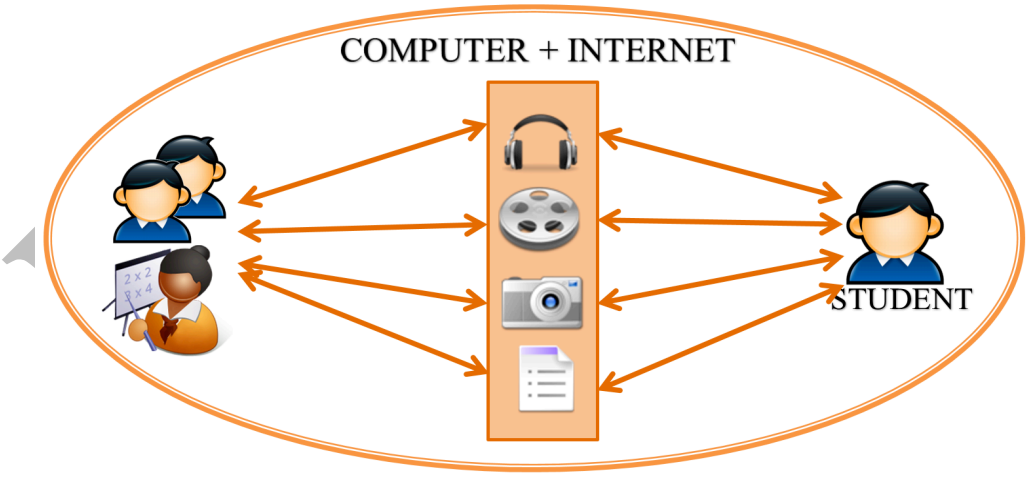
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independent manipulation by the educatee of the learning objects, for example through simulation.

Simulation is one of the most effective tools that enable continuous interactive verification of interpretations and instruction itself by means of simulators in many fields of human activity. Games and simulations allow people to learn and get education through play. Educational simulations can be fun, but more importantly, they always aim at and reach a certain target, they are meaningful and purposeful.

In terms of the educational process supported by information and communication technologies there are so called educational simulations, "*which helps the pupil model a part of the world and give him or her opportunity to test it safely and effectively.*" (Allesi & Trollip, 1991) The main reason for using simulations in education is an effort to base the learning on experience as the educatee undergoes an educational process in the form of so called experiential learning.

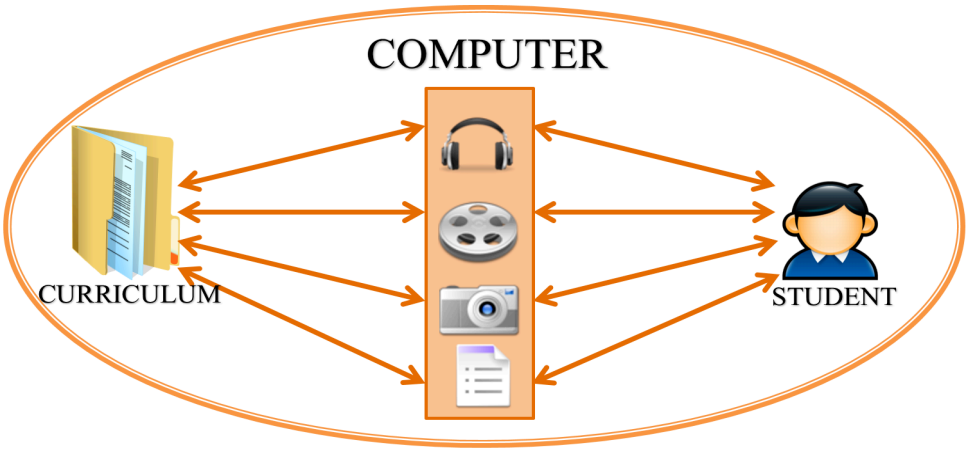
Educational simulations mediate situations which are found to be very similar to the real ones by humans. One gets an opportunity to try different procedures leading to different results. The impact of negative and positive feedback in the simulation is very strong, as the results of the actions taken are to be seen immediately. In case you have made a bad decision, you can go back and see what would have happened if the decision had been right. For a further insight into the concept of the first dimension of interactivity see Picture No. 4.



Picture 4: First dimension of interactivity

The second dimension of interactivity is based on the exchange of information between the participants of the educational process, which follows the traditional concept of interactivity and communication. However, this dimension stems from the theory of communication and is used to describe human communication based on dialogue and exchange, mediated by

information and communication technologies. For a further insight into the concept of the second dimension of interactivity see Picture No. 5.



Picture 5: Second dimension of interactivity

The development of information and communication technologies has thereby enabled the transmission of both direct and indirect communications into the virtual electronic environment. In this context, we speak about so called Computer-mediated communication, which represents one of the forms of social communication. Unlike direct, or face to face (TvT) communication, computer mediated communication represents an indirect form of interaction, mediated by communication media.

CONCLUSIONS

On the basis of the above stated comparison, it is possible to devise a new formulation, or come up with new understanding of the **principle of interactivity**, as a prerequisite for effective learning of pupils, and a means of achieving a wider range of learning objectives. Its assurance is now possible by means of educational simulation and/or virtual reality. This principle allows for long-term development of electronic ways of education, based on the consistent application of new knowledge in the field of pedagogy and psychology. The principle of interactivity in the "upgraded" concept not only comprises the communication component (communication in all directions, that is to say teacher - pupil, pupil - teacher, pupil - pupil), but also emphasizes the component of the manipulation by the pupil of the curriculum, which is presented by means of modern educational simulations and/or virtual reality. The said manipulation can involve the optional participation of the teacher, spontaneous or programmed. The application of this principle, important for education carried out with the support of information and communication technologies, facilitates the

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achievement of a wider range of learning objectives, not only in the cognitive, but especially in the affective and psychomotor areas.

The **principle of multimediality** used to be perceived as a way of facilitating the application of a wide range of transmission media for presenting the curriculum within the framework of distance education. It stemmed from the presumption of it being necessary to ensure the transfer of the subject matter to the educatee via the maximum possible number of channels; on the other hand, it did not accent the demand on these channels to carry the same information content, and thus stimulate more elements of the pupil's perception. This way of presentation of the subject matter was mainly reflected in the fact that only cognitive learning objectives could be achieved, which substantially limited the range of applicable learning strategies. Based on previously conducted analyses (Klement, Chráska, Dostál & Marešová, 2012), both theoretical and empirical, it is possible to argue that this perception of the multimediality no longer corresponds to the current level of knowledge, and it is necessary to reconsider its contents. However, in terms of education implemented with the support of information and communication technologies, it is more effective to use only one transmission medium - the Internet, and thus stimulate several elements of pupil`s perception at a time. It is it possible to present one piece of information simultaneously via text, static pictorial element, dynamic pictorial element, audiovisual recording, or any combination thereof. This new of understanding of the concept of multimediality is a necessary condition for the effective implementation of this type of education. Nowadays, *multimediality has to be understood as a means to stimulate multiple sides to pupil`s perception, and not just as a transfer of information via multiple media. This application is important especially for education carried out with the support of information and communication technologies, and enables the development of a wider range of learning strategies*.

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New Technologies In Maritime Education And Training, Turkish Experiment

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Abstract
The aim of this study is to introduce new technologies and approaches in the maritime education and training (MET) and as well as reviewing the Turkish experiment and its outcomes including along analysis which may be helpful for the future studies on this subject.
For example of, the Turkish on seafaring officer education is presented and discussed to identify and understand the problem areas to allow for proper actions to facilitate the innovation/adaptation process take place. Each step of process is analyzed to identify main sources of discrepancies and difficulties. The results of analysis are to help grouped to help formulate possible/probable solutions. After testing suitability, reliability and acceptability of several solutions, some applicable courses of actions are introduced.
The overall results of this study may be used by MET planners and researchers who will make further studies.

Key Words: Maritime Education and Training (MET); New Technologies; MET in Turkey; Vocational education; Matching Academic and Vocational Education

Introduction

The new ships are huge, state of arts and fully automated. To handle such modern ships efficiently and safely, the maritime industry needs highly qualified seafarers in particular seafaring officers.

Since the1980s crewing has been a significant problem for the maritime industry. Many studies such as BIMCO ISF Manpower Report 2005 and 2010 have proved that there has been a significant lack of seafaring officers. BIMCO/ISF (2010) states that 'The worldwide supply of seafaring officers in 2010 is estimated to be 624,000 and the current estimate of worldwide demand for seafaring officers is 637,000 officers in 2010'. The Germanischer Lloyd and Fraunhofer CML (2014) conducted a large scale study involving 100 ship management companies across the globe to find out what they are doing to improve their operations and what they consider as best practices in the industry. The companies have explained that their biggest challenges of ship management in mid-term future in five areas; Crewing (88%),

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Technical Management (62%), Financial Management (%50), Quality and Safety (%27) and procurement (12%).

Pourzanjani (2002) and Schroder (2004) state that the crewing problem does not consists only of quantity but also quality. There are also severe shortages of well qualified seafarers at different levels of seniority.

To improve the quality of the seafarers IMO (International Maritime Organization) started work to establish international standards in early 1970s. The IMO's STCW (Standards for Training, Certification and Watchkeeping) defines internationally recognized standards for crew on board. The competencies in the STCW are mainly based on technical and management skills, as well as practical studies focused on sea training. The STCW is the main reference of maritime education and training (MET).

MET is a unique area which requires meeting international standards in addition to national vocational qualification requirements. The Lingua Franca of the maritime business is English and seafaring officers are required to have sufficient English language skills. Demydenko (2012) states that 'Maritime English as a Global Language and Lingua Franca Maritime English is unanimously thought of as a global language used at sea'. All these facts make the design and delivery of MET very complex and require detailed studies. To achieve this difficult job, the MET planners try to achieve the following objectives;

- To ensure English language skills required for officers
- To deliver formative science (mathematics and natural science) for further academic and vocational subjects
- To balance the engineering and management skills of the cadets which both are essential for seafaring officers
- To match the academic and vocational education
- To match the international and local standards
- To adopt the new improvement in the programme to meet the requirements of the maritime industry
- To conduct scientific studies for innovation and post graduate studies

Method

The Turkish experiment involved the introduction of new technologies and approaches in the maritime education and training is conducted in three steps.

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In the first step was to understand the new technologies and approaches in MET and the impact of these improvements on the development of an effective system to provide qualified seafarers who are eligible to operate the ships effectively and safely.

The second step involved analysis of the current seafaring officer education system to understand the problem areas and identify actions to be taken to facilitate the adaptation process. The achievement process is included in this step and key issues which are the main sources of discrepancies and difficulties are highlighted.

In the final step the findings of the second steps are categorised, grouped and a further study made to formulate possible/probable solutions. After evaluating and testing these solutions, applicable course of actions are recommended.

New Technologies And Aproaches In The Met

MET institutes need to adopt new technologies and improvements. They also need to develop and transfer of innovation in their area of interest and that is the reason why many international MET platforms have been established such as the IMLA (International Maritime Lecturers Association), IAMU (International Association of Maritime Universities), METNET, GlobalMET, MariFuture etc.

As for new technologies and approaches in MET, the intention is not to mention names but to group them in accordance to functions achieved or addressed. These are;

- The excessive use of the simulators to reflect real life conditions
- Highly structured and lecturer and courses in long duration sea training as a follow up for academic studies to prepare the cadets for shipboard duties
- Improving the managerial skills of the cadets for their managerial roles enabling risk assessment and management at sea
- Designing holistic education and training programmes to meet both vocational and academic requirements
- Improvement of IT (Information Technology) skills of the cadets to understand and operate state of the art systems and ensure the safe use of automation on board
- The use of e-learning methods to facilitate the continuous education of the seafaring officers during their sea service
- Establishing strong cooperation and coordination with the maritime industry to improve the academic programme and quality of onboard training

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- External evaluation and verification of the education to provide feedback and ensure the quality of the education

The mock up bridge and engine rooms and fully equipped laboratories facilitate the delivery of the courses and provide a better understanding of equipment, system and their future roles for students.

Computer assisted training provides benefits to student to review of the subject delivered in the classroom and self assessment of their achievement as well as better evaluation opportunities for lecturers.

IT support allows students to get in touch with lecturers and tutors online. It is also important to connect the students and MET institutions during sea training to solve any problems.

Lifelong learning (LLL) is an essential part of modern life which provides people with further education opportunities. E-learning presents a great education and training opportunity for seafarers who are thousands of miles away from the shore facilities. Nowadays there are many MET institutions that provide e-learning for seafarers, including postgraduate studies.

Effective use of the results of Port State Controls (PSC) and establishment of permanent validation/evaluation organs such as EMSA (European Union maritime Safety Agency) provide an excellent quality assurance opportunity for MET institutions.

Globalization makes the world a small village. The maritime industry is a worldwide industry which requires full application of the international arrangements. In order to survive in the competitive and challenging maritime industry, all respective parties should meet gold standards not to be contented with minimum. There is no way to be successful without having qualified staff on board ships and so MET is a key element to ensure the quality. The only way to ensure quality in MET, is the continuous improvement of the system with development and transfer of innovation following and adapting the new technologies.

TURKISH EXPERIMEN

Improvement of Turkish Shipping Industry

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In 1980, the shipping industry was the beginning of the dark days and second-hand ship sales started with very low prices. The Turkish Chamber of Shipping was founded in 1981 and it became an important tool to organize the private shipping sector. The Under-secretariats of Maritime Affairs directly reporting to Prime Ministry took maritime administration responsibilities. The following year the government enacted a law concerning "Improvement of the Merchant Fleet and Incitement of Shipbuilding Industry" which provided finance for the shipowners up to 90 percent and guarantee for the freight (Turkish Government, 1982). Many new shipping companies have been established. This support allowed the shipowners to buy mainly second-hand ships and the tonnage of the fleet suddenly increased to 5.123.888 DWT in 1989. Since then many shipping companies have been established.

The beginning of the third millennium was a golden era for Turkish shipping. Until 2008 the increasing freight rates encouraged the shipowner to enhance and renew their fleet. Old ships have been decommissioned, scrapped or sold and subsequently new, modern and bigger ships have entered service. The same efforts have been spent to improve shipyards and ports. Most importantly the private sector and government agreed to apply higher standards outlined by the international bodies.

The financial turmoil since 2008 created a negative impact on the shipping industry. The sector has been badly hit by the crisis but managed to survive. At the end of the year 2013 the available figure of the total number of vessels over 1000 GT in the Turkish flagged had, was 641. That corresponds to a capacity of transportation reaching to 9.1 million DWT. Considering 21 million DWT ships operating under other flags; the total amount of the ships owned by Turkish shipowners reaches 30.1 million DWT. This value is actually, ranking Turkey 13th, among the countries which are known to be the world's largest fleet (IMEAK, 2014).

Initiative to improve MET in Turkey

Having high-cost, brand new ships, Turkish ship owners have become more anxious about the quality of crew particularly officer ranks and commenced revisiting the quality of MET in Turkey; this issue also became a concern of the government authorities. The new posture of the fleet suddenly attracted the attention of all respective parties on crew quality. The Chamber of Shipping, for some time now has been interested in seafarer's training since 1990. To respond the existing and future requirements of the shipping industry, Turkey has

been applying a new strategy to improve MET. This strategy is based on the following principals;

- To provide full industrial support to Maritime Education and Training in addition to efforts of the state
- To reach gold standards beyond the STCW's minimum standards to ensure qualified seafarer for the merchant fleet
- Establishing close cooperation between the maritime industry, maritime administration and MET institutes
- Increasing qualified seafarers in support of both national and world fleet

In order to achieve this strategy TUDEV (Turkish Maritime Education Foundation) was established in1993. TUDEV started to support all levels of MET institutions by providing equipment and direct financial support. In 1995 TUDEV established the Institute of Maritime Studies to graduate unlimited officers for the merchant fleet. 1612 navigation and 422 marine engineering officers were graduated from this institute between 2000 and 2011.

In parallel to this activation, TUDEV attempted a new initiative to establish a maritime university. The Piri Reis University which was named after famous Turkish Admiral and cartographer of 16th century, established in 2008. The aim of the PRU is beyond a centre for seafaring officers. The Engineering Faculty of PRU is now conducting education and further studies in full spectrum of ship construction industry including marine engine and electrical and electronics systems. The Faculty of Economics and Administrative Sciences handles three different programmes supporting maritime economics and maritime management studies as well as finance, foreign trade and logistics.

PRU believe that the international cooperation is the most appropriate avenue to improve quality of the education and training by the way of transfer of innovation and raising awareness of best practises in the other parts of the world. TUDEV established a strategy to achieve an effective international cooperation in 2003. The application of this multi-purpose cooperation is introduced in the Figure-1.

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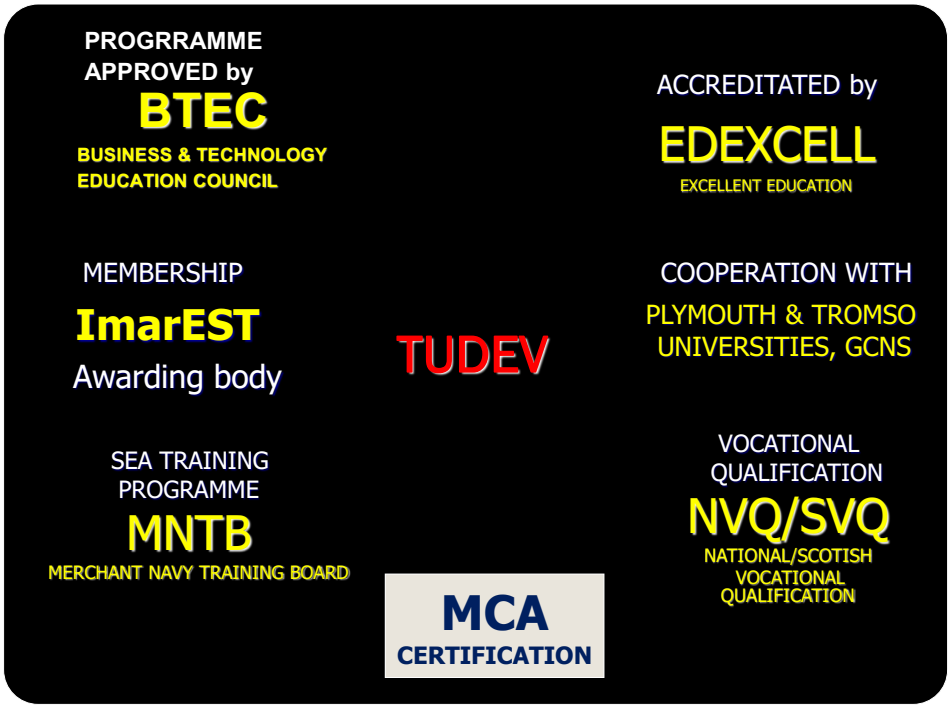


Figure1: International Cooperation of TUDEV

The main objectives of this cooperation are as follows;

- Cooperation with internationally recognized accreditation and awarding organizations
- Improvement of academic programmes in cooperation with recognized MET institutions.

As part of this strategy the following achievements should be noted;

- The HND Navigation and Marine Engineering programmes are adopted from UK BTEC
- MNTB (Merchant Navy Training Board) Sea Training Portfolio adopted
- TUDEV staff and students become members of United Kingdom's awarding body ImarEST (Institute of Maritime Engineering, Science and Technology) and agreed to accept MCA (Maritime and Coast Guard Agency) examination for certification
- Edexcel accreditation was gained.
- Selected cadets received benefits of European Union Mobility programmes and attended Plymouth University for fop-up programmes and, Glasgow College of Nautical Studies for Post-HND programmes
- A long duration EU Project is initiated to improve MET, namely SoS (Safety at Sea)
- TUDEV become a well known partner for many MET related EU Projects (UniMET, SURPASS, MARIFUTURE, SAIL AHEAD, M'AIDER CAPTAINS, MarTEL, MarTEL Plus etc.)

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Piri Reis University Underway

All these achievements, standards and process have been transferred to Piri Reis University. The Piri Reis University has more improved facilities, teaching staffs and state of art teaching aids in comparison with original TUDEV Institute of Maritime Studies facilities. Today PRU is in close cooperation with other MET institutions and takes part in many European Union (EU) and national projects. The international relations of PRU are resumed as follows;

The EU projects:

EBDIG WFSV
ACTS
METPROM
DECOMAR
MARINE
SEA TALK

ERASMUS agreements

- Latvian Maritime Academy/LATVIA
- Hochschule Wismar/GERMANY
- Antwerp Maritime Academy/BELGIUM
- Satakunta University of Applied Sciences/FINLAND
- Universitatea Maritima Constanta/ROMANIA
- Mircea Cel Batran" Naval Academy /ROMANIA
- Rijeka University Maritime Faculty /CROATIA
- University of Cantabria/SPAIN
- University of Sczcesin/POLAND
- West Pomeranian University of Technology, Szczecin/ POLAND
- Technological Educational Institution of Athens/GREECE
- Estonian Maritime Academy/ESTONIA

Cooperation with other universities

- Shanghai Maritime University /CHINA
- St. Petersburg Maritime University/RUSSIA
- Odesa National Maritime Academy/UKRAINE

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- KherC State Maritime University / UKRAINE
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DISCUSSION

The Internet facilitates communications between colleagues in distant countries. The lowering cost of air transportation allowed more cost efficient visits to international partners. European Union projects also facilitated the cooperation between the countries. DOI (Development of Innovation) and TOI (Transfer of Innovation) projects supported research activities and transfer of innovations and best practises between the European Countries, and the new Erasmus + projects look to continue this.

International projects

The aim is to develop and improve education system for world maritime community and we can achieve this by taking advantage of the opportunities offered us by technology and using advanced coordination techniques. Joint projects developed in the past and being currently completed will be a good example for the future activities and cooperation in this area.

Participation in MET related EU projects is a key tool to improving programmes. The following are examples of the improvements to Turkish MET programmes as a result of the transfer of innovation and best practises from other countries;

- Improvement of a unified MET system for the EU area (UniMET Project).
- Matching vocational and academic education and training programmes and ECVET versus ECTS (Be-TWIN Project).
- Matching the academic programmes of the MET institutions to facilitate student and lecturers exchange programmes (DECOMAR Project)
- Establishment of a Maritime Network of Education for development of maritime culture (MARINE Project)
- Introducing e-learning (e-GMDSS)

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It is accepted that international projects are more feasible than in-house studies. These projects create synergy and a platform for transfer of knowledge and innovations. A project which creates an innovative approach will be valuable not only for participants but also for all MET community. The joint projects developed by PRU/TUDEV so far will be good examples for future activities (Demirel, 2013). These projects provide perfect platforms for development and transfer of innovation as well as establishing a common understanding and application of standards.

The new roles of the universities

The mission and roles of the universities have changed in the 21st century. Research has become a significant issue for the universities. The relations with community became a social responsibility for the universities. Now it is the time to accelerate the improvement of the organization and management systems of maritime universities to balance teaching, research and community support functions.

The universities are also involved in Lifelong Learning programmes. They need to empower the continuous education centres. This requires improvement of e-learning and provision of special courses and certificate programmes to meet the requirements of business sectors.

However, government support for higher education is decreasing (Zade et al, 2002), as such universities should need to employ new sources in order to survive. Most importantly is the need to should create an effective and internationally recognized education system which provides graduates with better job opportunities.

The quality assurance

The Total Quality Management (TQM) system is the most commonly used tool to ensure the quality. TQM provides essential feedback to improve the quality of procedures and process applied. In particular Quality Assurance provided by recognized external authorities plays an important role to define corrective actions to reach the commonly accepted standards. External verification and continuous feedback support are required to ensure the quality of MET. This will provide a reliable support to continue the improvement of the system.

Improvement of teaching methods

Classic teaching methods are coming to an end. Such teaching methods may include class participation, demonstration, recitation, memorization, or combinations of these. The choice of a teaching method or methods depends largely on the information or skills that are being taught, and may also be influenced by the aptitude and enthusiasm of the students. The creation of new teaching methods will facilitate delivery of knowledge using all available assets and new technologies. The

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MET education may be improved by establishing an effective link through classroom teaching, the use of stand- alone computers, simulators and distance learning tools.

Course of Actions

Innovation in MET has been discussed in The IMLA 17 Conference conducted in 2010 at Shanghai/China. A paper has been presented by TUDEV/Piri Reis University to introduce lessons learned from Turkish experiment. In the light of the Turkish experiment the following course of actions are deemed applicable for all MET institutions;

- Seek suitable partners for cooperation
- Form consortiums to facilitate cooperation and collaboration
- Seek support from international and national bodies
- Conduct serious research into identified problems facing the industry to understand the main issues and identify measures that should be taken
- Develop serious proposals to meet the requirements
- Develop and motivate staff to conduct research on the maritime industry
- Publish papers in refereed conferences and journals for information exchange

This course of actions have already been exercised and achieved. So we assume that all are suitable, reliable and acceptable.

Conclusion

The shipping industry is now a high profile international industry which has adapted the new technology and good practices for its management and operations. The structure of competition in the shipping industry has changed. Cooperation between governments and shipowners to create innovative and flexible strategies to meet the differential market requirements is vital in such a challenging world.

A major part of the world foreign trade is carried out through maritime transportation. If the vision of a nation is to develop a significant maritime fleet, all aspects of the existing and future fleet requirements should be considered.

Availability of qualified seafarers is a key element of shipping which is of interest to all countries due to unbalanced supply and demand situation. The growing fleet means growing recruitment problem is also growing. All maritime players and countries need to work together to tackle the situation.

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The MET is a dynamic field that needs to be continuously reviewing and updating process supported by the transfer of technology and innovation. In the light of previous experiment and future strategies, the following course of action is proposed;

- Continuing the international cooperation and collaborations in particular regional cooperation which is more easy to establish and sharing mostly similar objectives
- The full support of Maritime Industry for MET is necessary for success
- Continued technology transfer is essential to improve MET
- Development and transfer of innovation is required for achieving quality
- Participation to international MET platforms is important to realize the new requirements promote the sharing of best practice
- Gold not minimum standards for MET should be targeted to ensure safety at sea b
- Close cooperation and collaboration between MET institutes and maritime industry is essential to meet expectations of the economy
- The MET institutions must update their organization and management systems to support the research requirements of the maritime industry
- The creation of synergy for combining vocational and academic education and qualification
- External Verification and establishment of a feedback system to ensure quality

The aim is to create a better education system for seafarers to ensure safety and security at sea. The new opportunities offered to us by technology and using advanced coordination methods means we can improve the quality of MET worldwide. International platforms which host large number of the MET experts create a favourable environment to initiate or launch international projects to improve the quality of maritime education and training.

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Online Journal Writing And Corrective Feedback On Tertiary Level EFL College Students' Attitudes And Writing

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Abstract

The study investigated the role of 15-week of online journal writing and corrective feedbacks on tertiary level EFL college students' attitudes toward online journal writing, attitudes toward corrective feedback, and their writing performance by using a pretest and post design. Twenty-eight participants were required to take an attitude survey, a feedback survey, and a writing pretest before training. The 20-item journal writing attitude survey, adopted from the study of Laysears-Smith (2005), included the constructs of knowledge of journal writing (5 items), perceptions of journal writing (7 items), and attitudes about journal writing (7 items). The 6–item feedback survey was developed by the researchers. The participants were asked to rate on a five-point Likert scale ranging from 5 strongly agree to 1 strongly disagree. The 120-word writing pretests were evaluated by two native speakers based on the criteria of content (13-30), organization (7-20), vocabulary (7-20), mechanics (2-5), and language use (5-25). After the pretest, the students participated in a fifteen-week online journal writing program by writing 15 journals weekly after reading, and they received corrective feedback in their journals from their teachers. The posttests were administered at the end of the program by using the same journal writing attitude questionnaire, feedback survey and a writing task. SPSS Pair-sample t tests were conducted for data analysis. Results showed that the participants had higher ratings on the constructs of knowledge of journal writing, perceptions of journal writing and attitudes about journal writing after the program, but it did not reach any significant differences. On the other hand, the students had significant improvement in their feedback survey and in their overall writing performance after 15-week of journal writing. Pedagogical implications were provided.

Key words: online journal writing, attitude , writing performance

1. Introduction

Journal writing, an interaction between the writers and the readers, is learner-centered or is like an oral conversation in a written form (Peyton & Reed, 1990; Peyton & Staton, 1991). Journal writing enhanced learners' language development, motivation, attitude and writing. It also can increase meaningful communication since the journal provides the chances for the exchange of ideas (Bromley, 1995; Green & Green, 1993; Worthington, 1997), and can provide a non-threatening atmosphere for students (Chang, 1996). Moon (1999, pp. 188–194) identifies benefits of writing journals, including:

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"To deepen the quality of learning, in the form of critical thinking or developing questioning attitude"

"To enable learners to understand their own learning process"

"To increase active involvement in learning and personal ownership of learning"

"To enhance professional practice or the professional self in practice"

"To enhance the personal valuing of the self towards self-empowerment"

"To enhance creativity by making better use of intuitive understanding"

"To free-up writing and the representation of learning"

"To provide an alternative `voice' for those not good at expressing themselves"

"To foster reflective and creative interaction in a group"

Through journal writing, learners can get free writing practice on a range of topics and in a natural context. They can have the opportunities to think about what they are doing and learning, and they can express their ideas, opinions and feelings.

Effects of Journal Writing on EFL Learners

Journal writing has been found to be effective to enhance learners' language development. For instance, studies of journal writing reported that EFL students have been consciously aware of their writing processes about their vocabulary acquisition and organizational strategies, grammar knowledge (Myers, 2001; Voit, 2009). In addition, it may help adults get over any fear of writing and lead to more self-confidence (Liao & Wong, 2010), more willingness to write, better self-understanding (Hiemstra, 2001), more positive attitudes

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toward writing (Jones, 1991; Luo, 2008). Journal writing, an important tool for learners' self-understanding and self-growth, enhanced their self-confidence and matured them through sharing their ideas, feelings, self-perceptions (Liao & Wong, 2010).

The benefits of journal writing as an intensive activity nurtured learners' intrinsic writing motivation, and develop greater self-awareness. They had positive attitude and expressed they would continue writing journals frequently (Liao & Wong, 2010; Tuan, 2010). Students ascertained that journal writing is an enjoyable experience since the aim of keeping a journal is "to encourage students to become involved and interested in writing"(White & Arndt, 1991, p. 63).

Holmes and Moulton (1997) investigated the impact of a 15-week dialogue journal writing as a learning strategy on six U.S. university students in their English composition class. Analyses of the data collected from students' weekly journals, four personal interviews about the participants' views toward journaling showed that the ESL students considered dialogue journaling as an effective and worthwhile approach for learning. In addition, the university students found that their dialogue journals helped them increase their thinking skills, writing fluency and motivation to write. Holmes and Moulton's (1997) findings support that dialogue journals provide a "highly visible and credible demonstration of modeling and of students' ability to write fluently and communicatively" (p. 619). Similarly, Luo (2008) investigated the effect of dialogue journals on 29 elementary school students' writing. Results showed that DJW can improve students' attitude toward English learning, and they improve most in writing content, followed by organization and vocabulary.

Journal Writing on EFL Learners' Writing

Another effect of journal writing is its benefits on EFL learners' writing. Many researchers have reported that a learner may start writing only for a few sentences. However, after several weeks of journal writing, their confidence grows, and they can write more easily and quickly (Jones, 1991; Peyton, 1988). In addition, journal writing was beneficial to the development of writing performance, and specifically learners have improved their

organizational skills and writing abilities (Chang & Lin, 2014). The group that received the additional writing journal assignment significantly improved the mechanics of their L2 writing, compared with the other group (Hirose & Sasaki, 2000 ; Peng & Hsu, 2006)

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In addition, the benefits of journal writing as a structured activity can improve learners' writing motivation, cognitive growth, writing skill, and writing fluency (Fulwiler, 1978; Tuan, 2010). For instance, Luo (2008) investigated the effect of dialogue journals on 29 elementary school students' writing. Results showed that DJW can improve attitude toward English learning, and they improve most in writing content, followed by organization and vocabulary.

EFL Learners' Attitudes toward Feedbacks in Journal writing

The issue of corrective feedback (CF) has recently received considerable attention in second language (L2) research, and there is much discussion on how to address errors in writing (Loewen & Philp, 2006; Nicholas, Lightbown & Spada, 2001; Sheen, 2007). Two types of error correction that have received attention from researchers to date are 'direct' and 'indirect' CF. For the purposes of the current study, the various types of feedback are defined as follows. Direct (corrective) feedback is defined as "the provision of the correct linguistic form or structure above or near the linguistic error," which could include "the crossing out of an unnecessary word/phrase/morpheme, the insertion of a missing word/phrase/morpheme, or the provision of the correct form or structure" (Bitchener, 2008, p. 105). More specifically, direct feedback means that the teacher explicitly provides the correct form.

For more effective writing, receiving feedback provided by supervisors or teachers as well as an awareness and sensitivity to the need for students is an important process of reflective journal writing (Harris, 2008). Learners benefited partly by the instructor's feedback on the journals included praise, questions, comments and suggestions (Bain, Mills, Ballantyne, & Packer, 2002; Cohen & Fischl, 2012). For instance, Chandler (2003) investigated the effect of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing. The students were freshmen and sophomore students majoring in music at an American conservatory. Also, types of error correction were explored. The participants' English proficiency was between 540 and 575 on the Test of English as a Foreign Language (TOEFL). The instruments included change in the accuracy of both revisions and of subsequent writing, change in holistic ratings, students' attitudes toward the four different kinds of teacher response. One of the findings showed that direct correction is best for producing accurate revisions, and students prefer it because it is the fastest and easiest way for them as well as the fastest way for teachers over several drafts.

Purpose of Study and Research Questions

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A review of studies showed that most of the studies focused on paper-based journal writing, comparatively fewer studies that focus on online journal writing. Secondly, most writing research has focused mostly on teachers' error correction strategies and their effects on student writing. Much less has been done to find out about students' attitudes toward teachers' error feedbacks (Lee, 2005).

In order to know whether the impact of online writing on tertiary level EFL college students, the researchers investigated the role of 15-week of online journal writing and corrective feedbacks on tertiary level EFL college students' attitudes toward online journal writing, attitudes toward corrective feedback, and their writing performance by using a pretest and post design.

The research questions are as follows:

1. What are the differences between EFL college students' attitude toward online journal writing and

corrective feedback before and after 15-week of online journal writing?

2. What are the differences between EFL college students' writing performance before and after 15-week of online journal writing?

2. Method

2.1 Participants

Twenty-eight tertiary level EFL university students participated in a fifteen-week of journal writing program. The average of their TOEIC (Test of English for International Communication) test scores was about 550. The average age of the students was about 18 to 19 years old, and the proportion of female participants was 15% while the male participants were 85%.

2.2 Instruments

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Three instruments were used in this study including an online journal writing attitude survey, a corrective feedback survey, and their writing performance. The 20-item journal writing attitude survey, adopted from the study of Laysears-Smith (2005), included the constructs of knowledge of journal writing (5 items), perceptions of journal writing (7 items), and attitudes about journal writing (7 items). The 6–item feedback survey was developed by the researchers.

The 6–item feedback survey was developed by the researchers. The participants rated the items on a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1). The questionnaire was validated by the researchers as appropriate for this study. The Cronbach's α value for journal writing attitude survey and feedback survey were 0.75 and 0.9 respectively. Students' 120-word writing pretests were evaluated by two native speakers based on the criteria of content (13-30), organization (7-20), vocabulary (7-20), mechanics (2-5), and language use (5-25). The inter rater reliability for students' writing were 0.82.

2.3 Procedure and Data Analysis

Before the 15-week of online journal writing program, the participants completed the pretests of attitudes toward online journal writing, attitudes toward corrective feedback, and their writing pretest. After training, the participants completed the same attitudes toward online journal writing survey, attitudes toward corrective feedback survey, and their writing posttest. Descriptive statistics, t tests and ANOVA t-tests were conducted to evaluate the participants' attitude change and writing performance between the pretest and the posttest.

3. Results and Discussion

Results of Research Question 1: What are the differences between EFL college students' attitudes toward online journal writing and corrective feedbacks before and after 15-week of online journal writing?

Descriptive Statistics for students' attitudes toward online journal writing survey, attitudes toward corrective feedback survey were presented in Table 1. For the pretest of attitude toward online journal writing, students had the highest rating in the construct of Knowledge of journal writing, followed by the construct of Perceptions of journal writing, and Attitudes of journal writing.

Similar trend can be found in the post test. The participants had higher ratings after 15

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weeks of journal writing in the attitude toward journal writng survey and corrective feedback survey. They only showed moderate agreement toward the attitudes toward online journal writing survey, and attitude toward correct feedback survey.

Table 1. Descriptive statistics for students' attitudes toward online journal writing, and corrective feedback

Questionnaire	*Pretest*			*Posttest*	
	Mean	*SD*	*SE*	*Mean*	*SD*
	SE				
Knowledge of journal writing	3.06	0.47	0.09	3.16	0.37
	0.07				
Perceptions of journal writing	2.86	0.64	0.12	3.09	0.38
	0.07				
Attitudes of journal writing	2.68	0.89	0.17	2.91	0.47
	0.09				
Overall performance	2.87	0.55	0.10	3.05	0.30
	0.06				
Feedback	3.30	0.62	0.12	3.85	0.60
	0.11				

The students' attitudes increased in the constructs of Knowledge of journal writing, Perceptions of journal writing, Attitudes of journal writing, and their overall performance as measured by the comparison between the attitude toward online journal writing pre－and post-test survey. However, unlike previous studies which showed that journal writing had significant impact on learners' attitude, ANOVA Analyses for their attitudes toward journal writing had increased, but did not reach any significant improvement. Therefore, it is important for students to be aware of the impact of their journal writing practices on their writing, which should be fed back to teachers to help them develop better writing.

In terms of their perceptions toward corrective feedback (see Table 2), their responses toward feedback had significantly increased (p= .001). Most of the students indicated that they benefited more from the instructor's feedbacks on the journals. Based on their responses, they thought teachers' feedback can improve their writing skills, and are helpful for their second drafts revision. They enjoyed sharing their journal writing with their teachers. Generally, they were satisfied with their teachers' feedback, and they benefited from teachers' comments and suggestions, which were in line with previous research (Bain, Mills, Ballantyne, & Packer, 2002; Cohen & Fischl, 2012; Lee, 2005).

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Table 2. ANOVA analyses for students' attitudes toward online journal writing, attitudes and corrective feedback

Questionnaire	*Sum of Square*	*df*	*Mean square*	*F*	*p*
Knowledge of journal writing	Between Groups	0.12	1	0.12	0.68	0.41
	Within Groups	9.55	54	0.18		
Perceptions of journal writing	Between Groups	0.70	1	0.70	2.49	0.12
	Within Groups	15.18	54	0.28		
Attitudes of journal writing	Between Groups	0.74	1	0.74	1.47	0.23
	Within Groups	27.13	54	0.50		
Overall performance	Between Groups	0.47	1	0.47	2.42	0.13
	Within Groups	10.54	54	0.19		
Feedback	Between Groups	4.30	1	4.30	11.47	0.001**
	Within Groups	20.25	54	0.38		

** $p<.01$

Results of Research Question 2: What are the differences between EFL college students' writing performance before and after 15-week of online journal writing?

Descriptive Statistics showed that students had improved their writing in terms of their content, organization, vocabulary, language use, and their overall writing performance.

Table 3. Descriptive statistics for students' pretest and post test in writing

	Pretest			*Posttest*		
	Mean	*SD*	*SE*	*Mean*	*SD*	*SE*
Content	14.64	1.31	0.25	15.50	1.67	0.32
Organization	12.32	1.93	0.36	14.50	1.67	0.32
Vocabulary	11.32	1.83	0.35	15.00	1.98	0.37
Mechanics	3.04	0.33	0.06	2.96	0.43	0.08
Language use	11.75	1.80	0.34	14.71	1.76	0.33
Writing Overall	53.07	6.34	1.20	62.68	7.12	1.35

ANOVA Analyses for comparing their pretest and posttest in their writing showed they reached significant improvement in their content ($p< .05$), organization ($p< .05$), vocabulary ($p< .05$), language use ($p< .05$), and overall writing performance ($p< .05$) (see Table 4). Similar to previous studies, the group that received writing journal assignment significantly improved in their L2 writing, compared with the other group (Hirose & Sasaki, 2000 ; Peng & Hsu, 2006).

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Table 4. ANOVA analyses for students' pretest and posttest in writing

	Sum of Square	*df*	*Mean square*	*F*	*p*
Content	Between Groups	10.29	1	10.29	4.57	0.04**
	Within Groups	121.43	54	2.25		
Organization	Between Groups	66.45	1	66.45	20.49	.000***
	Within Groups	175.11	54	3.24		
Vocabulary	Between Groups	189.45	1	189.45	52.17	.000***
	Within Groups	196.11	54	3.63		
Mechanics	Between Groups	.07	1	.07	0.49	0.49
	Within Groups	7.93	54	.15		
Language use	Between Groups	123.02	1	123.02	38.86	.000***
	Within Groups	170.95	54	3.17		
Writing Overall	Between Groups	1292.16	1	1292.16	28.43	.000***
	Within Groups	2453.96	54	45.44		

4. Conclusion and Limitation

The study investigated the role of 15-week of online journal writing and corrective feedbacks on tertiary level EFL college students' attitudes toward online journal writing, attitudes toward corrective feedback, and their writing performance by using a pretest and post design. Results showed that the participants had higher ratings on the constructs of knowledge of journal writing, perceptions of journal writing and attitudes about journal writing after the program, but it did not reach any significant differences. On the other hand, the students had significant improvement in their feedback survey and in their overall writing performance after 15-week of journal writing. The study confirmed that online journal writing can improve learners' attitude slightly but increase learners' attitudes toward feedback and writing performance significantly. For students, such practice is valuable if they can keep online journaling in their school years. For teachers, online journal writing can serve as a great tool for teachers to integrate online journal writing in their writing courses.

Limitations

There are several limitations of this study. First of all, including a control group was strongly recommended for future research. Secondly, this study only elicited students' writing performance before and after ER program. Employing qualitative methods like interviews, or classroom observations may generate a more complete profile of the participants' attitude

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change during the ER program. Furthermore, this study employed direct feedback on students' journal writing. For future studies, investigating the effect of indirect feedback or other types of indirect feedback on L2 writers was encouraged because different effects between direct and indirect feedbacks have been documented in L2 writing. Finally, including a larger sample of the participants and conducting the experiment for longer duration was suggested for future research.

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Öğrenme Deneyimlerinin Yakalanması İçin Çoklu Algılayıcılı Bir Yaşam Günlüğü Sisteminin Geliştirilmesi

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Özet
Bireylerin yaşam deneyimlerine ait görüntü, ses, video, konum vb. günlük verilerinin kendiliğinden ve sürekli olarak yakalanmasına olanak sağlayan yaşam günlüğü sistemleri öğrenme deneyimlerinin de yakalanması, kaydedilmesi ve tekrar erişilmesi için olanaklar sunmaktadır. Önceki çalışmalarda, bireyin kullandığı bilgisayarlardan elde edilen ekran ve kamera görüntüleri ile akıllı telefonlar ve giyilebilir kameralardan elde edilen görüntülerle oluşturulan bir dijital yaşam günlüğü sisteminin yaşam boyu öğrenme deneyimlerinin yönetilmesini kolaylaştırdığı görülmüştür. Bu çalışmada ise ekran ve kamera görüntülerini pasif biçimde yakalamanın yanı sıra, aktif biçimde ses, video ve ekran videosu kaydetme, yakalanan günlükleri ve içerikleri bulut üzerinden aktararak zaman çizgisinde bir araya getirme ve çok ortamlı bir görüntüleyici ile tarayabilme işlevlerine sahip olan bir yaşam günlüğü sistemi tasarlanmıştır. Tasarıma ait bir prototip yazılım geliştirilerek öğrenme deneyimlerinin yakalanması ve görüntülenmesi için sağladığı olanaklar incelenmiştir. Çalışmanın sonuç bölümünde sistemin kullanım biçimleri ve geliştirilebilir özellikleri tartışılmıştır.

Anahtar Sözcükler: Yaşam günlüğü, öğrenme deneyimleri, algılayıcılar, deneyim görüntüleyici

Development Of A Multı-Sensor Based Lıfeloggıng System For Capturıng Learnıng Experıences

Abstract
Lifelogging systems, which enables us to capture daily data belonging to life experiences of the individuals such as image, audio, video, location etc. continuously and automatically, also give us opportunity for capturing, recording and re-accessing these learning experiences. During previous studies, it is seen that a digital life logging system, which is formed by camera and screen shots taken via computers, smart phones and wearable cameras used by the individual, eases management of lifelong learning experiences. In this study, besides capturing screen and camera shots passively, a lifelogging system which can record audio, video and screen these videos actively, bring together the log data caught and the content on timeline via transferring them on cloud and browsing them by a multimedia viewer, is designed. By developing a prototype software, the opportunities provided for capturing and screening the learning experiences by the designed lifelogging have been examined. In the results section, usage styles and upgradable features of the system are discussed.

Keywords: Lifelogging, learning experiences, sensors, experience viewer

GİRİŞ

Enformasyon ve iletişim teknolojilerinin günlük kullanımdaki yoğunluğu arttıkça bireylerin aynı anda birden fazla faaliyetle meşgul olmaları olağan hale gelmiştir. Yolda yürürken akıllı telefon kullanmak, televizyon seyrederken tablet kullanmak, bilgisayarda iş yaparken bir canlı sohbet aracıyla başkalarıyla iletişimde olmak sıradanlaşmıştır. Bu durum

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bireylerin eşzamanlı olarak birden fazla öğrenme uzayına sahip olmalarına ve farklı öğrenme gereksinimlerini farklı kaynaklardan eşzamanlı gidermelerine olanak sağlamaktadır ve güncel alan yazınında "yaşam genişliğinde öğrenme" olarak adlandırılmaktadır (Barnett, 2010). Teknolojinin sağladığı bu "gereksinim anında öğrenme" olanağı ve bu olanağın kullanımıyla gerçekleştirilen "öğren – uygula – unut" süreci yeterince belgelenmediği durumda bireyin öğrenme deneyimlerine olan farkındalığının azalmasına ve sahip olduğu makro ve mikro yetkinliklerin envanterini oluşturmasına engel olmaktadır. Bu sorunu aşmak için yaşam genişliğinde öğrenme boyunca yaşanan öğrenme deneyimlerinin düzenli bir şekilde kaydedilmesi gerekmektedir. Deneyimlere ait bu kayıtlar daha sonra bu deneyimlerin farkına varılması, ayırt edilmesi, anımsanması ve deneyimlerin yönetilmesi için fırsat sağlayacaktır. Deneyimleri kaydetme işleminin sürdürülebilir olması için bireyin fazla vakit ayırmasına gerek kalmadan deneyim yakalayabilen dijital sistemlere gereksinim bulunmaktadır.

Bu çalışmada bireyin yaşam genişliğindeki öğrenme deneyimlerinin yakalanması, farkına varılması, ayırt edilmesi ve anımsanması amacıyla kullanılabilecek dijital bir yaşam günlüğü sisteminin tasarlanması ve geliştirilmesi amaçlanmıştır.

İzleyen bölümlerde, uygulanan araştırma yöntemi açıklanmış, yaşam genişliğindeki öğrenme deneyimlerinin yakalanması ve yorumlanmasına yönelik olarak oluşturulan bir kuramsal çerçeveden yararlanılarak, bir yaşam günlüğü sistemi tasarlanmış ve geliştirilen prototip yazılımlar tanıtılarak kullanıcı testlerinden elde edilen ilk bulgulara yer verilmiştir. Çalışmanın son bölümünde araştırma sonuçları değerlendirilmiş ve önerilen sistemin geliştirilmesine yönelik olanaklar tartışılmıştır.

YÖNTEM

Çalışmada ele alınan problemin çözümü için tasarım tabanlı araştırma yöntemi uygulanmıştır. Tasarım tabanlı araştırma Wang ve Hannafin (2005) tarafından "analiz, tasarım, geliştirme ve uygulama süreçlerinin, araştırmacılar ve katılımcılar ile işbirliği içinde ve gerçek uygulama ortamında ardışık ve sürekli olarak uygulandığı, bağlama duyarlı tasarım ilkelerinin ve kuramlarının geliştirilmesine yönelik, eğitim uygulamalarını iyileştirme amacıyla yapılan sistematik ve esnek bir araştırma yöntemi" şeklinde tanımlanmıştır. Buna göre tasarım tabanlı araştırma tasarımcılar, araştırmacılar ve uygulayıcıların işbirliği içerisinde yürütülen etkileşimli, kendini tekrarlayan, esnek bir araştırma sürecidir. Reeves'e (2006) göre tasarım tabanlı araştırmanın adımları; (a) araştırmacılar ve uygulayıcılar

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tarafından mevcut problemlerin analiz edilmesi, (b) teknolojik yenilik ve var olan tasarım prensipleri kullanarak çözümlerin geliştirilmesi, (c) çözümlerin bulunması için kendini sürekli yenileyen test ve geliştirme süreci ve (d) çözüm üretimine katkıda bulunmak ve tasarım prensipleri oluşturmak için yansıtma şeklinde tanımlanmıştır. Buna göre, ilk önce problemin çözümlenmesi amacıyla literatür taraması gerçekleştirilmiş, problemin çözümünü sağlayacak bir sistem tasarımı gerçekleştirilmiş, ardından tasarlanan sistemin probleme ait uygulanabilir bir çözüm elde edilene kadar ardışık iyileştirmelerle geliştirilmesi sağlanmış, bu süreç boyunca da elde edilen çözüm sürekli denenmiş ve elde edilen bulgular rapor haline getirilmiştir.

Yaşam Günlüğü

Yaşam deneyimlerini kaydetmek için geleneksel yöntem günlük tutmaktır. Günümüzde bu işlemin kendiliğinden gerçekleşmesini sağlamak amacıyla "yaşam günlüğü" adı verilen teknolojiler geliştirilmektedir. Yaşam günlüğü araştırmalarının kökeni 1940'larda Vannevar Bush tarafından ortaya atılan ve bireyin gördüğü ve duyduğu her şeyin kaydedilmesini sağlayan Memex isimli bir cihaz önerisine dayanmaktadır (Bush, 1945). Bu vizyon Steve Mann'ın 1980'lerde başlayan giyilebilir bilgisayar araştırmaları ile gerçeğe dönüşmeye başlamıştır. 1990'larda MIT'de Mann'ın de içinde yer aldığı bir grup araştırmacının çalışmaları artırılmış gerçeklik alanında gelişmelere yol açmıştır (Mann, 2004). 2000'lerin başında Aizawa çok sayıda algılayıcıyla donatılmış bir giyilebilir bilgisayar aracılığıyla ses, fotoğraf ve videonun yanısıra bilgisayar aracılığıyla gerçekleştirilen bütün iletişim bilgileri, konum bilgileri ve kalp atışları gibi biyolojik bilgileri de sürekli olarak kaydedebilmiştir (Aizawa vd., 2004). Aynı dönemde Microsoft firmasında Microsoft SenseCam olarak isimlendirilen sürekli pasif bir biçimde fotoğraf çeken giyilebilir bir fotoğraf makinası geliştirilmiştir (Hodges vd., 2006). Bu makine ve diğer Microsoft araştırmacılarının katkılarıyla araştırmacı Gordon Bell gördüğü, duyduğu, seyrettiği, okuduğu çok sayıda ve çeşitte veriyi kaydedebilen ve bu verileri erişilebilir bir biçimde saklayan giyilebilir bir sistem geliştirmiş ve yıllarca kendi üzerinde denemiştir (Gemmell vd., 2002). Microsoft Sense Cam 2000'li yıllar boyunca İrlanda Dublin Üniversitesi ile İngiltere Oxford Üniversitesinde çok sayıda yaşam günlüğü araştırmasında kullanılmış ve özellikle Alzheimer hastaları üzerinde olumlu sonuçlar alınmıştır. Bu çalışmalarda kaydedilen görüntülerin görüntü tanıma teknikleriyle anlamlandırılması konusunda gelişmeler kaydedilmiştir (Hodges vd., 2011). 2013 yılında SenseCam mimarisine dayalı olarak geliştirilen Autographer (http://www.autographer.com) ve bir kickstart projesi olan Narrative (http://getnarrative.com)

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giyilebilir kameraları yaygınlaşmaya başlamışlardır. Google Glass ve benzeri giyilebilir cihazlar yaşam günlüğü için önemli olanaklar sunmaktadır. Günümüzde giyilebilir algılayıcıların alanı giderek genişlemiş ve bu alanda çalışan araştırmacılar ve şirketler "sayısallaştırılmış öz" (Quantified Self) hareketi etrafında toplanmışlardır (http://quantifiedself.com/). Bireylerin öğrenme deneyimlerini incelemek amacıyla yapılan çalışmalarda bireylerin kullandıkları bilgisayarların ekran görüntülerinin de kaydedilmesinin önemli olduğu görülmüştür (Mutlu vd., 2015).

Yaşam günlüğü alanındaki çalışmalarda Sellen ve Whittaker'in vurguladıkları ve 5R ile ifade edilen (recollecting, reminiscing, retrieving, reflecting, remembering intentions) yararlar öne çıkmaktadır (Sellen ve Whittaker, 2010):

- **Anımsamak:** Belirli yaşam deneyimlerini zihinsel olarak tekrar yaşayabilmek. Örneğin, kaybolan bir nesnenin yerini hatırlamak.
- **Anıları Canlandırmak:** Geçmiş deneyimlere ait duygusal ve manevi anıları tekrar yaşamak. Örneğin, fotoğraf albümlerine bakmak.
- **Erişmek:** Üzerinden yıllar geçmiş özel sayısal enformasyonu tekrar geri getirmek. Örneğin, Belgeler, e-postalar ve Web sayfaları.
- **Yansıtmak (kendini tanımak):** Geçmiş deneyimleri gözden geçirerek bireyin davranışlarında zamanla oluşan örüntülerin bireyin kendisi tarafından keşfedilmesini sağlamak.
- **Niyetleri Anımsamak:** Bireyin yaşamındaki olası olayları anımsamak.

Görüldüğü gibi yaşam günlüğünde "anımsama" nın özel bir yeri bulunmaktadır. Tulving'e göre zamanın akışının geriye çevrilememesi gerçeğinin bir istisnası bireyin geçmişte olanları anımsama yeteneğidir. Birey bugün, dün olan bir şeyi düşündüğünde aslında zihinsel bir zaman yolculuğu gerçekleştirmiş olur (Tulving, 2002). Bu durumda, bir yaşam günlüğünün her şeyi kaydetmesine gerek yoktur; deneyime ait anımsatıcı ipuçlarını yakalaması yeterlidir. Bunlar o deneyime ait bir görüntü ya da yer bilgisi gibi kesikli veriler olabilir.

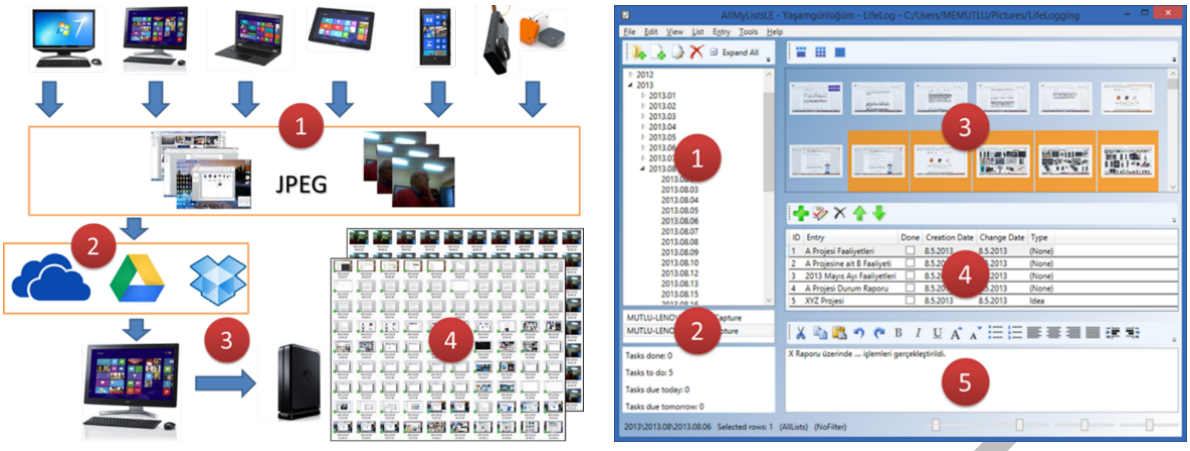
Öğrenme Deneyimleri

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Öğrenme deneyimi kavramı Mutlu (2015a) tarafından "öğrenme" ve "deneyim" sözcüklerinin ansiklopedik tanımlarından yola çıkarak "yeni bilgi, davranış, beceri, değer ya da tercihleri kazandıran, değiştiren ya da güçlendiren katıldığımız ya da maruz kaldığımız fiziksel, zihinsel, duygusal, ruhani, dini, sosyal ya da sanal olay ya da etkinlik" olarak tanımlanmıştır. Bireyin öğrenme deneyimleri uzayı, yaşam boyu öğrenme, yaşam genişliğinde öğrenme ve yaşam derinliğinde öğrenme olarak üç boyutta ele alınabilmektedir (Karlsson 2008, Karlsson ve Kjisik 2009). Barnett'a göre yaşam boyu öğrenme yaşamın ardışık zamanlarında oluşan öğrenme deneyimlerini ifade ederken, yaşam genişliğinde öğrenme farklı ortamlarda eş zamanlı olarak gerçekleşen öğrenmedir (Barnett, 2010). Yaşam boyu öğrenme zaman eksenine vurgu yaparken yaşam genişliğinde öğrenme ise öğrenme uzaylarına vurgu yapar. Yaşam derinliğinde öğrenme ise fiziksel bir boyutla değil, bireyin iç dünyası ve kişilik gelişimiyle ilişkilendirilir. Yaşam genişliğinde öğrenme kavramına göre birey biçimsel, yarı biçimsel ve biçimsel olmayan öğrenmeye ait farklı uzaylardaki öğrenme deneyimlerini aynı anda yaşıyor olabilir. Böylece biçimsel, yarı biçimsel ve biçimsel olmayan öğrenmenin farklı zaman ve mekân dilimlerindeki birbirinden bağımsız olgular olarak değil, bireyin bütün hayatı boyunca ardışık olabileceği gibi, bir birine paralel ve iç içe geçmiş olarak da devam edebilen süreçler olarak ele alınması gerektiği vurgulanmış olmaktadır.

Mutlu ve arkadaşları (2015) bireyin sahip olduğu bilgisayar, tablet ve akıllı telefonlarda ekran ve kamera görüntülerinin sürekli olarak yakalanması ve bu görüntülerin düzenli aralıklarla birey tarafından taranmasının *biçimsel olmayan öğrenme* deneyimlerinin farkına varılması, ayırt edilmesi ve anımsanmasında etkili olduğunu göstermişlerdir. Geliştirilen yaşam günlüğü sistemi ve *öğrenme deneyimleri yönetimi yaklaşımı* (Mutlu, 2015a) bireyin yaşam boyunca biçimsel olmayan öğrenme deneyimlerini yönetebilmesi için fırsat sunmaktadır (Şekil 1.)

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Şekil 1: Ekran ve kamera görüntüsü yakalamaya dayalı yaşam günlüğü sistemi (Mutlu, 2015a)

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Yaşam Genişliğinde Öğrenme Deneyimleri

Yaşam deneyimleri içerisinde biçimsel olmayan öğrenme deneyimlerinin elde edilmesine odaklanan bu çalışmanın kuramsal çerçevesinin *yaşam genişliğinde öğrenme* için genişletilmesi amacıyla gerçekleştirilen bir çalışmada biçimsel öğrenme, yarı biçimsel öğrenme ve biçimsel olmayan öğrenmede yaşanan deneyimlerin yapılandırılmışlık düzeyleri incelenmiştir (Mutlu, 2014a). Buna göre, öğrenme deneyimleri, yapılandırılmış deneyimler, yarı yapılandırılmış deneyimler ve yapılandırılmamış deneyimler olarak sınıflandırılabilir ve yaşam genişliğindeki öğrenme türleri ile öğrenme deneyimi türleri arasında bir taksonomi oluşturulabilir (Tablo 1).

Tablo 1: Öğrenme ve deneyim türleri (Mutlu, 2014a)

Öğrenme türü	Biçimsel öğrenme	Yarı biçimsel öğrenme	Biçimsel olmayan öğrenme
Otorite	Eğitim kurumu	Çalışılan, üye olunan ya da hizmet alınan kuruluş	Öğrenenin kendisi
Yapılandırılmış deneyimler	Spesifik örnek: Öğreticilerden yüzyüze, uzaktan ya da karma biçimde öğrenme. (Öğrenme bütünüyle eğitim kurumu tarafından yapılandırılmıştır.) Genellikle ders izleme, sınıf içi etkinlikleri gerçekleştirme, sınav olma	Spesifik örnek: Öğreticilerden yüzyüze, uzaktan ya da karma biçimde öğrenme. (Öğrenme bütünüyle çalışılan, üye olunan ya da hizmet alınan kuruluş tarafından yapılandırılmıştır.) Genellikle ders izleme, sınıf içi etkinlikleri gerçekleştirme, sınav olma.	Spesifik örnek: Öz yönlendirmeli öğrenme. (Öğreticilerin yerini öğrenme kaynakları ve rehberler almaktadır – öğrenme bütünüyle öğrenen tarafından yapılandırılmıştır.) Genellikle öğrenme kaynaklarını okuma, dinleme, seyretme; rehbere danışma, örnekleri tekrar etme; eksersizleri yapma, kendini sınama etkinlikleri gerçekleştirme.
Yarı yapılandırılmış deneyimler	Spesifik örnek: Grup çalışması, diğer öğrencilerle iletişim, sosyal öğrenme vb. biçimde başkalarından öğrenme. (Öğrenme bir ölçüde eğitim kurumu, bir ölçüde öğrenen tarafından yapılandırılmıştır.) Genellikle başkalarına sorma, bir proje/problem üzerinde başkalarıyla birlikte çalışma.	Spesifik örnek: Grup çalışması, diğer öğrencilerle iletişim, sosyal öğrenme vb. biçimde başkalarından öğrenme. (Öğrenme bir ölçüde çalışılan, üye olunan ya da hizmet alınan kuruluş, bir ölçüde öğrenen tarafından yapılandırılmıştır.) Genellikle başkalarına sorma, bir proje/problem üzerinde başkalarıyla birlikte çalışma.	Spesifik örnek: Tepkisel (tesadüfi) öğrenme ve bütünleşik öğrenme. (Öğrenme bir ölçüde öğrenen tarafından yapılandırılmıştır.) Genellikle öğrenme planlanmadan ama bilincinde olarak, ya da planlanmış ama bilincinde olmadan gerçekleşir.
Yapılandırılmamış deneyimler	Spesifik örnek: Kendi kendine çalışma. (Zamanını, süresini ve yöntemini öğrenenin kendisi belirler). Genellikle öğrenme içeriklerinin / kaynaklarının üzerinden geçme, not alma, özetleme, eksersiz yapma, ödev yapma.	Spesifik örnek: Kendi kendine çalışma. (Zamanını, süresini ve yöntemini öğrenenin kendisi belirler). Genellikle iş başında çalışma, eksersiz yapma, deneme-yanılma çalışması yapma, öğrendiklerini uygulama.	Spesifik örnek: Üstü örtük (sözsüz) öğrenme. (Öğrenmenin zamanı ve/veya süresi ve/veya yöntemi belirlenmemiştir.) Genellikle öğrenme diğer etkinliklerin bir yan ürünü olarak ortaya çıkar. Öğrenen öğrenmeyi önceden planlamamıştır ve o anda öğrendiğinin farkında da değildir.

Mutlu (2014a) bu matristeki her hücre için öğrenme deneyimlerinin nasıl yakalanabileceğini inceleyerek, sadece öğrenme deneyimlerinin anımsanmasını sağlayacak ipuçlarının yakalanması değil aynı zamanda öğrenme içeriklerinin de yakalanabileceği bir yapı önermiştir. Böylece, birey daha sonra başka bir yöntemle erişemeyeceği öğrenme içeriğini de deneyimi yaşarken yaşam günlüğüne kaydedebilir. Yaşam boyu öğrenme

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deneyimlerinin daha sonra hatırlamak ve tekrar yaşamak amacıyla yaşandıkları anda yakalanması sürecini sistematik bir bakış açısıyla betimlemek için, öğrenme türlerinin özellikleri, öğrenme ortamları ve günlük kaydedici cihazlar ile algılayıcılar sınıflandırılarak bir çerçeve elde edilmiştir. Deneyim yakalama cihazlarıyla yakalanan günlük verilerinin birey tarafından gözden geçirilerek yorumlanması daha sonra o deneyimlere erişmede kolaylık sağlayacaktır. Yaşam genişliğinde öğrenme deneyimlerine ait yakalanan günlük verilerinin nasıl yorumlanabileceğine ilişkin ayrıntılı bir çerçeve sunulmuştur (Mutlu, 2014b).

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Tablo 2: Öğrenme ve deneyim türlerine karşı gelen etkinlikler (Mutlu, 2014b).

Öğrenme türü	Biçimsel öğrenme	Yarı biçimsel öğrenme	Biçimsel olmayan öğrenme
Otorite	**Eğitim kurumu**	**Çalışılan, üye olunan ya da hizmet alınan kuruluş**	**Öğrenenin kendisi**
Yapılandırılmış deneyimler (Bu deneyimlerin yeri, zamanı ve kapsamı önceden belirlidir.)	Bu etkinlikler deneyim anında ve deneyim sonrasında yorumlanabileceği gibi eğitim kurumunun öğretim planı doğrultusunda sonradan onaylanmak koşuluyla deneyim öncesinde de ön yorumlama yapılabilir.	Bu etkinlikler deneyim anında ve deneyim sonrasında yorumlanabileceği gibi kuruluşun öğretim planı doğrultusunda sonradan onaylanmak koşuluyla deneyim öncesinde de ön yorumlama yapılabilir.	Bu etkinlikler deneyim anında ve deneyim sonrasında yorumlanabileceği gibi bireysel öğrenim planı doğrultusunda sonradan onaylanmak koşuluyla deneyim öncesinde de ön yorumlama yapılabilir.
Yarı yapılandırılmış deneyimler (Bu deneyimlerin yeri, zamanı ve kapsamı kesin değildir.)	Bu etkinlikler deneyim sonrasında yorumlanabileceği gibi bir bölümü deneyim anında yorumlanabilir.	Bu etkinlikler deneyim sonrasında yorumlanabileceği gibi bir bölümü deneyim anında yorumlanabilir.	Bu etkinlikler deneyim sonrasında yorumlanabileceği gibi bir bölümü deneyim anında yorumlanabilir.*
Yapılandırılmamış deneyimler (Bu deneyimlerin yeri, zamanı ve kapsamı hakkında genellikle önceden bilgi yoktur.)	Bu etkinlikler deneyim sonrasında yorumlanabilir	Bu etkinlikler deneyim sonrasında yorumlanabilir.	Bu etkinlikler deneyim sonrasında yorumlanabilir.**

(*) ve (**) Bu deneyimleri yorumlayabilmek amacıyla bireyin kişisel ve kurumsal bilgi çalışması ortamlarındaki deneyimlerinin taranması gerekebilir. Bu ortamlar kişisel ve kurumsal iletişim ortamı, kişisel ve kurumsal medya ortamı, kişisel ve kurumsal işlemler ortamı, kişisel ve kurumsal çalışma ortamı, kişisel ve kurumsal yayıncılık ortamı, kişisel ve kurumsal öğrenme ortamı ile kişisel ve kurumsal araştırma ortamı olarak gruplandırılmıştır (Mutlu, 2014a).

Tablo 3: Yapılandırılmışlık düzeyi ve yorumlamanın zamanlaması (Mutlu, 2014b)

Yapılandırılmışlık düzeyi	Yapılandırılmış öğrenme deneyimleri	Yarı yapılandırılmış öğrenme deneyimleri	Yapılandırılmamış öğrenme deneyimleri
Kullanılabilir yaşam günlüğü cihazları	Masaüstü, dizüstü, tablet, akıllı telefon, giyilebilir yaşam günlüğü kamerası	Dizüstü, tablet, akıllı telefon, giyilebilir yaşam günlüğü kamerası	Akıllı telefon, giyilebilir yaşam günlüğü kamerası
Deneyim öncesinde yapılan yorumlar	Program, ders, öğretici, konu, kaynaklar, araçlar, gerçekleştirilmesi öngörülen işlemler ve eylemler vb. bilgilerin girilmesi	-	-
Deneyim anında yapılan yorumlar*	Öğrenme esnasında notlar, sorular, çıkarımlar vb. bilgilerin kaydedilmesi	Program, ders, öğretici, konu, kaynaklar, araçlar, gerçekleştirilen işlemler ve eylemler vb. bilgilerin girilmesi. Öğrenme esnasında notlar, sorular, çıkarımlar vb. bilgilerin kaydedilmesi	-
Deneyim sonrasında yapılan yorumlar	Deneyimle ilgili yorumların gözden geçirilmesi ve onaylanması	Deneyimle ilgili yorumların gözden geçirilmesi ve onaylanması	Program, ders, öğretici, konu, kaynaklar, araçlar, gerçekleştirilen işlemler ve eylemler vb. bilgilerin girilmesi. Deneyime ait çıkarımlar vb. bilgilerin kaydedilmesi. Deneyimle ilgili yorumların gözden geçirilmesi ve onaylanması

(*) Eğer deneyim anında aktif kayıt olanağı bulunuyorsa deneyim kapsamındaki içerik ve gerçekleşen iletişim de ses, video ya da ekran videosu biçiminde yakalanabilir.

Öğrenme deneyimleri yaşam deneyimleri içerisinde yeralırlar ve her öğrenme deneyimine yaşam deneyimlerinin temel bağlamları eşlik eder. Bağlamlar deneyimlerin daha sonra anımsanması, farkına varılması ve anlamlandırılması için gereklidirler. Benzer deneyimler benzer bağlamlara sahip olduğu için deneyimlerin sınıflandırılması ve deneyimlere ait kişisel bilgi tabanının yönetimi için etkili bir bağlam modeline gereksinim vardır. Yaşam günlüğü ile

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yakalanan öğrenme deneyimlerine yönelik *öğrenme deneyimleri bağlam modeli* geliştirilmiştir (Mutlu, 2015b). Önerilen modelde yaşam günlüğü sistemiyle içerik ve günlük verilerinin yakalanması; günlük verilerinin yorumlanması; deneyimlerden bağlamların çıkartılması ve ontolojiye eklenmesi ve anlamsal ağın kullanımı aşamaları bulunmaktadır. Anlamsal ağ, bireyin, deneyim, içerik ve bağlamların oluşturduğu uzayda dolanmasına olanak sağlayacaktır.

SİSTEMİN TASARIMI

Sistem Gereksinimleri

Problemin çözümü için önceki bölümde gerçekleştirilen çözümleme, bireyin yaşam genişliğindeki öğrenme deneyimlerini daha sonra hatırlayabileceği biçimde yakalaması amacıyla pasif olarak sürekli görüntü, ekran görüntüsü ve konum verisi kaydetmesi gerektiğini; bu deneyimlere eşlik eden ve daha sonra başka bir yöntemle erişemeyeceği içerikleri yakalaması amacıyla da aktif olarak ses, video ve ekran videosu kaydetmesi gerektiğini göstermiştir. Birey ayrıca yakalanan deneyimleri tarayabileceği ve yorumlayabileceği bir araca da sahip olmalıdır.

Sistemin Genel ve İşlevsel Tasarım İlkelerinin Belirlenmesi

Sistemin işlevsel ve genel tasarım ilkeleri için kaynak olarak, yaşam boyu biçimsel olmayan öğrenme deneyimlerinin yönetimi için geliştirilen öğrenme deneyimleri yaklaşımı ve yaşam günlüğü sisteminden (Mutlu, 2015a) ve geliştirme esnasında kullanılan tasarım prensiplerinden (Mutlu; 2013a, 2013b); yaşam genişliğindeki öğrenme deneyimlerinin yakalanmasına, yorumlanmasına ve bağlamlarının elde edilmesine yönelik kuramsal çerçeveden (Mutlu, 2014a, 2014b, Mutlu 2015b) yararlanılmıştır:

- Otomatik çalışma: Görüntü, ekran görüntüsü ve konum yakalama yazılımları, (kullanıcı özel anlarında günlük yakalama işlemini kapatma gereksinimi duymadığı sürece), pasif bir biçimde, ilgili cihazın açılmasıyla bir kez başlatıldıktan sonra cihaz kapatılana kadar kendiliğinden her T saniyede bir veri alabilmeli, kullanıcının kayıt alma işlemini gözetlemesi-denetlemesine gerek kalmamalıdır. Benzer şekilde, kullanıcının aktif biçimde başlattığı ses, video ve ekran videosu yakalama uygulamaları da kullanıcı kaydı durdurana kadar her T saniyede bir T saniye uzunluğunda kayıt yapabilmelidirler. Kullanıcı her an ve her yerde aktif biçimde deneyimlere ait yazılı not alabilmelidir.

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- Genişletilebilirlik: Deneyim yakalayıcı yazılımlar birden çok cihaza kurulabilmeli, aynı anda birden çok cihazda çalışabilmelidir. Aynı şekilde bir cihazda birden çok algılayıcıdan günlük verisi yakalanabilmelidir.
- Kolay Kullanım: Sistemin kullanımı özel bir eğitime gerek kalmadan kolayca öğrenilebilmeli, sadece amaca yönelik işlevleri içeren bir basitlikte olmalıdır. Yakalayıcı yazılımlar kuruldukları cihazlardaki algılayıcıları otomatik olarak farketmeli ve kullandırmalıdır.
- Yönetilebilirlik: Çok sayıda cihazdan aynı ya da farklı anlarda elde edilen görsel, işitsel ve konumsal günlük verileri bir birine karışmadan ayırt edilebilmeli, belirlenmiş bir çalışma bilgisayarına kolayca transfer edilerek bir araya getirilebilmeli, deneyimlere ait binlerce veriye bir görüntüleyici araç yardımıyla kolayca erişilebilmeli ve içerikleri görüntülenebilmelidir.
- Sürdürülebilirlik: Tasarlanacak sistem kullanıcıya en az düzeyde iş yükü getirmeli, sistemin yıllık gereksinim duyduğu depolama ve internet trafiği kapasitesi kabul edilebilir büyüklüklerde olmalıdır. Böylece sistem yıllarca kullanılabilmelidir.
- Güvenlik: Yaşam günlüğüne ait ortam ve yorum veritabanı kolayca taşınabilir ve yedeklenebilir olmalı, başkalarının erişimine kapalı olmalı.
- Esneklik: Gerek ortam veritabanı, gerekse yorum veritabanında her deneyim için sınırsız düğüm ve sınırsız öğe oluşturabilmeli, kes-kopyala-yapıştır özelliği ve diğer ortamlara veri aktarabilme olanakları bulunmalıdır. Deneyimlere ait günlük verilerini yıl-ay-gün ve kayıt cihazı temelinde listeleyebilecek ve filtreleyebilecek araçlar barındırmalıdır.

Sistemin tasarım öğeleri olarak Windows 8.1 işletim sistemi, Windows 8.1 işletim sistemi kullanan masaüstü, dizüstü ve tablet bilgisayarlar, OneDrive bulut depolama hizmeti ve dış yedekleme birimleri kullanılmıştır. Akıllı telefonlar, genel amaçla ekran görüntüsü yakalanamaması; ses, görüntü, konum ve video kaydının tabletlerde de yapılabilmesi nedeniyle tasarıma dahil edilmemişlerdir. Yaşam günlüğü kameraları ise ses ve video kaydetmemeleri nedeniyle dışarıda bırakılmışlardır. Hem akıllı telefonlar hem de yaşam günlüğü kameralarının işlevlerinin birer çoklu kayıt aracına dönüştürülmüş tabletlerle de gerçekleştirilebileceği öngörülmüştür.

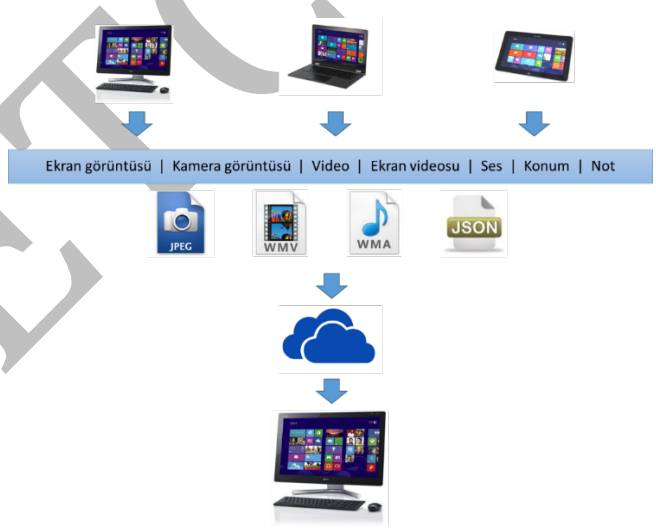
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Sistemin Başlangıç Tasarımı

Sistemi oluşturan donanım bileşenleri cihazlar ve cihazlar üzerinde bulunan algılayıcılardır. Sistemin yazılım bileşenleri ise bu cihazlarda çalışacak olan günlük yakalama uygulamaları ile sadece çalışma bilgisayarında kullanılacak olan yaşam günlüğü görüntüleyicisi uygulamasıdır (Tablo 4)(Şekil 2).

Tablo 4: Sistemin bileşenleri

Cihazlar	Algılayıcılar	Pasif günlük yakalama uygulamaları	Aktif günlük yakalama uygulamaları	Yaşam günlüğü görüntüleyicisi
Windows 8.1 İşletim sistemi ile çalışmaktadırlar.	Bilgisayara gömülü ya da dışarıdan takılan algılayıcılar olabilir.	Kendiliğinden, varsayılan olarak 30 saniyede bir yakalama yapılmaktadır.	İsteğe bağlı olarak başlatılmakta, varsayılan olarak 360 saniyede bir, 360 saniye uzunluğunda kayıt yapılmaktadır.	Sadece günlük verilerinin biraraya getirildiği çalışma bilgisayarında kullanılmaktadır. Çalışma bilgisayarında ayrıca bir dış depolama birimi bulunur.
• Masaüstü bilgisayarlar • Dizüstü bilgisayarlar • Tabletler	• Bilgisayar kameraları • Konum algılayıcıları • Bilgisayar mikrofonları • Bilgisayar ekranları	• Kamera görüntüsü • Ekran görüntüsü • Konum verisi	• Ses • Video • Ekran videosu • Not	• Verilen bir tarihte yakalama için kullanılan cihazlar ve algılayıcıları seçebilme • Verilen bir tarihte, cihazda ve algılayıcıdaki günlük verilerini listeleyebilme, görüntüleyebilme • Geçmiş, güncel ya da gelecek bir tarihe ya da günlük verilerine ait yorum girebilme • Yorumlar üzerinde arama yapabilme • Deneyimlere eşlik eden bağlamlardan bir kişisel bilgi tabanı oluşturabilme



Şekil 2: Sistemin işleyişi

SİSTEMİN GELİŞTİRİLMESİ

Sistemin geliştirilmesinde Mutlu (2015a)'da oluşan teknik birikim ve deneyimler yol gösterici olmuştur. Önceki çalışmada geliştirilmiş ve denenmiş olan ekran görüntüsü yakalama ve kamera görüntüsü yakalama yazılımları gözden geçirilerek yeniden yazılmış;

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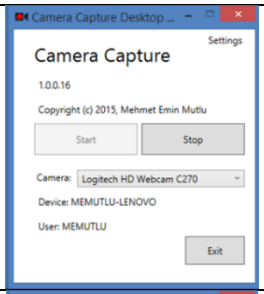
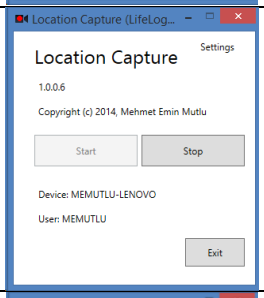
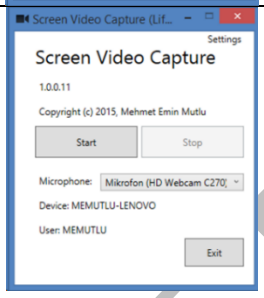
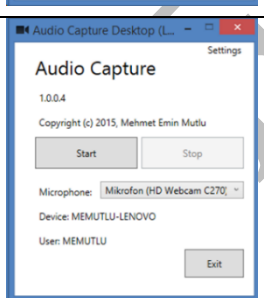
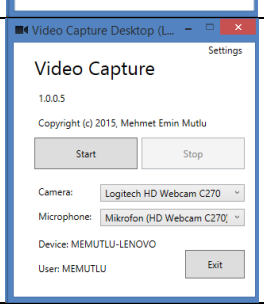
konum yakalama, ekran videosu yakalama, video yakalama, ses yakalama ve not yakalama yazılımları ise özgün olarak geliştirilmişlerdir.

Prototip Uygulamaların Geliştirilmesi

Çalışma kapsamında Tablo 5'de özelliklerine yer verilen deneyim yakalama uygulamaları geliştirilmiştir.

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Tablo 5: Deneyim yakalama uygulamaları

	LifeLoggingCCDesktop kamera görüntüsü yakalama uygulaması , "Start" düğmesine tıklandığında, "Stop" düğmesine tıklanana kadar, varsayılan olarak 30 saniyede bir, varsayılan kameradan görüntü yakalar ve tarih-zaman etiketiyle isimlendirerek kullanıcının OneDrive klasörüne ".jpeg" formatında kaydeder. Cihazda birden fazla kamera varsa kullanıcı kamera değiştirebilir. Bu uygulamada görüntü yakalamak için Emgu.CV API'si kullanılmış, sistem kameralarını belirlemek için DirectShowLib API'sinden yararlanılmıştır. Kamera görüntüsü yakalama uygulaması deneyimin yaşandığı çevreye ait görüntüleri yakalamak amacıyla kullanılır.
	LifeLoggingSC Ekran görüntüsü yakalama uygulaması , "Start" düğmesine tıklandığında, "Stop" düğmesine tıklanana kadar her 30 saniyede bir cihazın ekranındaki görüntüyü yakalamakta ve tarih-zaman etiketiyle isimlendirerek kullanıcının OneDrive klasörüne kaydetmektedir. Ekran görüntüsü yakalamak ve görüntü kalitesini belirlemek için için System.Drawing ve System.Drawing.Imaging API'lerinden yararlanılmıştır. Yakalanan görüntüler ".jpeg" formatında saklanmaktadır. Ekran görüntüsü yakalama uygulaması bilgisayar ortamında yaşanan sanal deneyimlere ait görüntülerin yakalanması amacıyla kullanılır.
	LifeLoggingLCDesktop konum yakalama yazılımında, "Start" düğmesine tıklandığında, "Stop" düğmesine tıklanana kadar, her 30 saniyede bir cihazın bulunduğu konumu belirleyerek, tarih-zaman etiketli JSON dosyaları biçiminde kullanıcının OneDrive klasörüne kaydetmektedir. Konum verisi cihazın GPS, GSM ve Wi-Fi algılayıcılarından elde edilir. Windows 8.1 masaüstü uygulamalarında konum verisi elde etmek için Visual Studio geliştirme ortamında System.Device.Location isim uzayından yararlanılmıştır. Konum yakalama uygulaması deneyimin yaşandığı anda bulunulan konumun kaydedilmesi amacıyla kullanılır.
	LifeLoggingSVC ekran videosu yakalama uygulaması çalıştırıldıktan sonra kullanıcı tarafından "Start" düğmesine tıklandığında "Stop" düğmesine tıklanana kadar her 360 saniye süresince yakalanan ekran görüntüsü 640x480 büyüklüğünde saniyede 30 kareden oluşan bir videoya dönüştürmekte, tarih-zaman etiketiyle isimlendirilerek, kullanıcının OneDrive klasörüne ".wmv" formatında kaydetmektedir. Kullanıcı ekran videosu kaydederken isteğe bağlı olarak mikrofon seçebilmektedir. Ekran videosu yakalamak için Microsoft Expression Encoder 4 API kullanılmıştır. Bu nedenle kullanıcının bilgisayarında Microsoft Expression Encoder 4 with Service Pack 2 (SP2) kurulu olmalıdır. Ekran videosu yakalama uygulaması çevrimiçi dersleri yakalama, bilgisayarda gerçekleştirilen karmaşık süreçleri video halinde kaydetme, ekran videolu not alma ve yaşam günlüğüne ekleme amacıyla kullanılabilmektedir.
	LifeLoggingACDesktop ses yakalama uygulamasında "Start" düğmesine tıkladıktan sonra "Stop" düğmesine tıklayana kadar her 360 saniyede yakalanan bir sesler 360 saniye uzunluğunda ses dosyaları halinde kullanıcının OneDrive klasörüne tarih-zaman etiketiyle isimlendirilerek kaydedilmektedir. Bu sürümde Microsoft Expression Encoder 4 kullanılmıştır ve kullanıcının bilgisayarında Microsoft Expression Encoder 4 with Service Pack 2 (SP2) kurulu olmalıdır. Yakalanan sesler ".wma" formatında kaydedilmektedir. Kullanıcı eğer cihazda birden fazla mikrofon varsa mikrofon seçimi yapabilmektedir. Ses yakalama uygulaması, yaşam seslerini yakalama, sesli not alma, toplantı ve görüşmeleri kaydetme ve yaşam günlüğüne ekleme amacıyla kullanılmaktadır.
	LifeLoggingVCDesktop Video yakalama uygulamasında "Start" düğmesine tıklandıktan sonra her 360 saniyede bir 360 saniye süreyle video kaydı yapılmakta, tarih-zaman etiketiyle isimlendirilmekte ve kullanıcının OneDrive klasörüne ".wmv" dosyası olarak kaydedilmektedir. 640x480 boyutlarındaki videoların 6 dakikası yaklaşık 14-15 MB büyüklüğünde yer kaplamaktadır. Video yakalamak için Microsoft Expression Encoder 4 kullanılmıştır ve uygulamanın çalışacağı bilgisayarlarda Microsoft Expression Encoder 4 with Service Pack 2 (SP2) kurulu olması gerekmektedir. Kullanıcı uygulamada kamera ve mikrofon seçimi yapabilmektedir. Video yakalama uygulaması videolu not alma, ders, deney, çalışma, toplantı, görüşme gibi etkinlik/olay yakalama ve yaşam günlüğüne ekleme amacıyla kullanılmaktadır.

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Deneyim yakalama uygulamalarının hangi cihazlarda ne zaman kullanılacaklarına dair, üniversitede görevli evli ve çocuklu akademisyenlere yönelik olarak, bir çizelge hazırlanmıştır. Çizelgenin son sürümü Tablo 6'da görülmektedir. Buna göre, aynı anda birden fazla cihazda yakalama yapılabilmekte; deneyim yakalama, iş saatlerinde masaüstü bilgisayarda yoğunlaşmakta; tabletler ise birer yaşam günlüğü yakalama cihazı olarak çalışma saatleri dışında neredeyse tüm gün kullanılmakta, çalışma saatlerinde ise şarj edilmektedirler. Dizüstü bilgisayarlar ise ofis ortamı dışındaki profesyonel süreçlerde kullanılmakta ve yakalama yapmaktadırlar. Diğer meslek ve yaş grupları için farklı çizelgeler hazırlanabilir.

Tablo 6: Cihazların ve algılayıcıların kullanım çizelgesi

Kayıt cihazı			Tablet							Dizüstü bilgisayar							Masaüstü bilgisayar						
Kayıt türü			Konum kaydı	Ses kaydı	Görüntü kaydı	Ekran görüntüsü kaydı	Video kaydı	Not Kaydı	Ekran videosu kaydı	Konum kaydı	Ses kaydı	Görüntü kaydı	Ekran görüntüsü kaydı	Video kaydı	Not Kaydı	Ekran videosu kaydı	Konum Kaydı	Ses kaydı	Görüntü kaydı	Ekran görüntüsü kaydı	Video kaydı	Not Kaydı	Ekran videosu kaydı
Haftaiçi Etkinlikleri																							
	06.45-08.45	Kalkış ve hazırlanma	X	X	X	X	X	X	X														
	08.45-09.00	İşe gidiş	X	X	X	X	X	X	X														
	09.00-13:00	Çalışma															X	X	X	X	X	X	X
	13:00-14:00	Öğle yemeği ve dinlenme	X	X	X	X	X	X	X														
	14.00-18.00	Çalışma															X	X	X	X	X	X	X
	18:00-18:15	Eve gidiş	X	X	X	X	X	X	X														
	18:15-23:00	Ev etkinlikleri ve sosyal medya	X	X	X	X	X	X	X														
	18:15-23:01	Çalışma																					
	23:00-23:00	Yatış	X	X	X	X	X	X	X														
Hafta sonu etkinlikleri																							
		Ev içi etkinlikleri ve sosyal medya	X	X	X	X	X	X	X														
		Çalışma															X	X	X	X	X	X	X
		Alışveriş	X	X	X	X	X	X	X														
		Spor	X	X	X	X	X	X	X														
		Çocuklarla etkinlikler gerçekleştirme	X	X	X	X	X	X	X														
		Sosyal ve kültürel ortamlar	X	X	X	X	X	X	X														
		Kültürel ortamlar	X	X	X	X	X	X	X														
		Akraba, arkadaş ziyaretleri /misafir ağırlama	X	X	X	X	X	X	X														
		Dışarıda yemek yeme	X	X	X	X	X	X	X														
		Eğlence/dinlenme yerlerine gitme	X	X	X	X	X	X	X														
		Otomobil kullanma																					
Çalışma etkinlikleri																							
		Araştırma-geliştirme															X	X	X	X	X	X	X
		Akademik çalışma yapma															X	X	X	X	X	X	X
		İş toplantılarına katılma	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Konferans / seminer dinleme	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Sunum yapma	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Ders verme	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Etkinlikler arası geçiş	X	X	X	X	X	X	X														
Rutin olmayan etkinlikler																							
		Şehirlerarası/ülkeler arası seyahat	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Kurumlarla etkileşimler	X	X	X	X	X	X	X														
		Tatil ortamları	X	X	X	X	X	X	X														
		Sağlık ortamları	X	X	X	X	X	X	X														
		Eğitim ortamları	X	X	X	X	X	X	X														
		....	X	X	X	X	X	X	X														

Verilerin Aktarılması

Deneyim yakalama uygulamaları yakaladıkları günlük verilerini, üzerinde çalıştıkları cihazın o kullanıcıya ait OneDrive klasöründe, zaman, cihaz ve algılayıcı bilgilerine göre oluşturulmuş bir alt klasöre kaydederler. Deneyim yakalamak için kullanılan cihazların OneDrive klasörlerinin "kullanılabilirlik" özelliği "Yalnızca çevrimiçi" olarak ayarlandığı durumda sadece tek taraflı veri akışı sağlanmış olur. OneDrive'da biriken günlük verileri, üzerlerinde çalışmak amacıyla bir çalışma bilgisayarına indirilirler. Bu amaçla çalışma bilgisayarı olarak seçilen bilgisayarın ilgili OneDrive klasörünün "kullanılabilirlik" özelliği "Çevrimdışı kullan" olarak ayarlanır. Deneyimlerin kaydedildiği OneDrive klasörü çalışma bilgisayarındaki yerel bir diske taşınarak OneDrive klasörleri boşaltılabilir. Böylece hem günlük verileri büyüdükçe OneDrive için ek ödeme yapmak zorunda kalınmaz, hem de

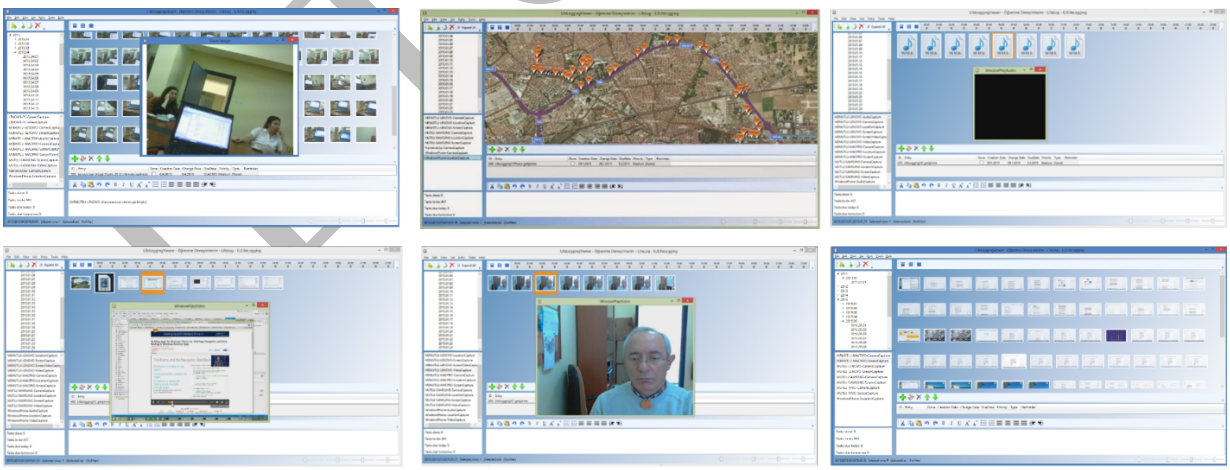
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OneDrive'da o anda henüz çalışma bilgisayarına indirilmemiş günlük verilerini görüntülerken bekleme yapmak zorunda kalınmaz.

Deneyimlerin Görüntülenmesi

Günlük yakalama yazılımlarıyla yakalanan verilerin görüntülenmesi amacıyla LifeLoggingViewer uygulaması geliştirilmiştir. LifeLoggingViewer uygulamasının kökeni daha önceki bir projede geliştirilen AllMyListsLE yazılımıdır (Mutlu, 2015a). Deneyim yakalayıcı uygulamalarla yakalanan ekran ve kamera görüntülerinin bir zaman çizelgesi boyunca görüntülenmesi ve seçilen görüntü gruplarına yorum yazılması olanağı sağlayan AllMyListsLE yazılımı elden geçirilmiş, güncel SDK'ya uyarlanmış ve görüntü görüntülemenin yanı sıra video, ses ve konum görüntüleme olanağı da eklenerek LifeLoggingViewer olarak yeniden isimlendirilmiştir. LifeLoggingViewer'a çalışma bilgisayarında deneyim verilerinin tutulduğu klasör tanıtıldıktan sonra, bir daha bu klasör değiştirilmediği sürece, günlük verileri bir zaman çizgisi yardımıyla erişime açılacaktır.

Kullanıcı LifeLoggingViewer'da tarih listesinden bir gün seçtiğinde, o gün kullanılmış olan tüm yakalama cihazları listelenir. Bu listeden bir cihaz seçildiğinde, o algılayıcıyla yakalanan tüm güne ait veriler ekranda uygun görüntüleyici kullanılarak görüntülenir. Kullanıcı gün içerisinde bir saat seçerek, seçili cihaz tarafından o saat boyunca yakalanmış olan bütün günlük verilerine erişir (Şekil 3).



Şekil 3: LifeLoggingViewer deneyim görüntüleme ve yorumlama uygulaması

Deneyimlerin Yorumlanması

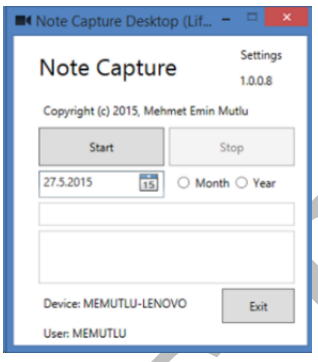
LifeLoggingViewer uygulaması ile seçili bir yıla, aya, güne ya da gün içerisindeki günlük verilerinden seçilerek oluşturulacak bir deneyime zengin metin biçiminde yorumlar girilebilir.

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Kullanıcı yaşam günlüğünü bir iki gün arayla gözden geçirerek, yaşadığı deneyimlere etiket, açıklama, not vb. şeklinde yorumlar girebilir ve daha sonra bu yorumları güncelleyebilir. Deneyimlere ait yorumları etkinlik/olay yorumları, epizodlar ve öyküler halinde hiyerarşik biçimde düzenleyerek, birey genelde yaşam deneyimlerini, özelde öğrenme deneyimlerini planlayabilir, izleyip denetleyebilir ve değerlendirebilir (Mutlu, 2014b). LifeLoggingViewer başlangıçta günlük verilerinin tutulduğu yerel klasörle ilişkilendirilmiş bir yorum veritabanını oluşturur ve daha sonra onu kullanır. Hem günlük verilerinin tutulduğu klasörün, hem de yorum veritabanının zaman zaman bir dış depolama birimine yedeklenmesi gerekir.

Kullanıcının deneyimi yaşarken yorumlayabilmesi ile geçmiş ya da gelecekteki bir deneyime ait bir düşünceyi "aklına geldiği anda" yakalayarak yaşam günlüğü üzerinde o deneyime ait zaman konumuna yerleştirebilmesi "düşünüm" işlemini etkin kılacak ve "unutma" sonucu ortaya çıkacak kayıpları azaltacaktır. Bu amaçla LifeLoggingNCDesktop not yakalama uygulaması geliştirilmiştir (Tablo 7).

Tablo 7: Not yakalama uygulaması



LifeLoggingNCDesktop aracı ile kullanıcı o anda yaşadığı bir deneyime ait bir yorumu, geçmişte yaşanmış bir deneyime ait bir değerlendirmeyi ya da gelecekte yaşanması muhtemel bir yaşam deneyimine ait bir planlama notunu bu araç yardımıyla aklına geldiği anda girmekte ve bulut üzerinden gerçekleşen transfer ile bu notlar LifeLoggingViewer yazılımının veritabanına eklenmektedir.

Not yakalama uygulamasında kullanıcı yorumları aksi belirtilmediği durumda o güne ait bir not olarak oluşturulur. Kullanıcı isterse geçmiş ya da gelecekteki bir güne not ekleyebileceği gibi, herhangi bir ay ya da yıla ait düğüme de not gönderebilir. Not yakalama aracıyla yakalanan notlar diğer günlük verileri gibi yıl/ay/gün tarih etiketiyle isimlendirilen birer JSON dosyası olarak oluşturulurlar ve yakalamanın gerçekleştirildiği cihazın adıyla ilişkilendirilen bir klasörde taşınırlar. Kullanıcı LifeLoggingViewer uygulamasını çalıştırdığında gönderilmiş notları ilgili gün, ay ya da yıl düğümlerinde bir girdi olarak görür.

Kullanıcı yaşam günlüğünün herhangi bir gününde; o güne ait o gün girilmiş yorumları, geçmişten gelen yorumları ve gelecekten gelen yorumları "Creation Date" alanı yardımıyla birbirinden ayırt edebilmektedir. Böylece kullanıcı zaman çizgisindeki deneyimler üzerinde içinde bulunduğu tarihin her iki yönünde Tulving'in (2002) ifade ettiği zaman yolculuğunu yapabilmektedir.

Deneyimlere Ait Bağlamların Belirlenmesi

Öğrenme deneyimleri yönetimi yaklaşımında, yakalanan yaşam deneyimlerinin yorumlanmasından sonra deneyime ait bağlamların belirlenmesi ve yoruma eklenmesi öngörülmektedir. Kullanıcının yaşadığı deneyimlere ait bağlamları “kişiler”, “yerler”, “olaylar”,” “davranışlar”, “özellikler”, “duygular” ve “varlıklar” olarak sınıflandırması ve bu

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başlıklarda birer ontoloji oluşturması beklenmektedir (Mutlu, 2015b). LifeLoggingViewer uygulaması yaşam deneyimlerini görüntüleme ve yorumlama amacıyla kullanılan "MyLog" türü veritabanı dosyalarının yanı sıra, kişisel bilgi tabanı oluşturmak amacıyla "MyLists" türü veritabanı dosyalarının oluşturulmasına da olanak sağlar (Mutlu, 2013b). Birey, belirlediği öncekilerden farklı olan yeni bağlamları kişisel bilgi tabanına ekleyerek, deneyimler, içerikler ve bağlamlar arasında ilişkiler oluşturabilir. Deneyimler, içerikler ve bağlamlar arasında bir anlamsal ağın kurulması amacıyla yürütülmekte olan bir araştırma bulunmaktadır (Mutlu, 2015b).

Deneyimlerin Yönetilmesi

Kullanıcıların öğrenme deneyimlerini yönetmeleri, gelecek deneyimleri planlama, güncel deneyimleri izleme ve denetleme; geçmiş deneyimleri değerlendirme ile gerçekleştirilir. Bu süreç kişisel olarak oluşturulabilecek bir dizi planlama, denetleme ve değerlendirme listesiyle yürütülebileceği gibi, LifeLoggingViewer içerisinde de gerçekleştirilebilir. Kullanıcıların LifeLoggingViewer'da geçmiş, güncel ve geleceğe ait deneyimlere etkinlik/olay, epizod ve öykü yorumları girebilmeleri, deneyimleri yönetebilmeleri için olanak sağlar. Bu amaçla geleceğe ait etkinlik/olay, epizod ve öyküleri planlanabilir; güncel etkinlik/olay, epizod ve öykülerle öğrenme deneyimleri izlenebilir ve denetlenebilir; geçmiş etkinlik/olay, epizod ve öykülerle de öğrenme deneyimleri değerlendirilebilir.

Sistemin Denenmesi ve Değerlendirilmesi

Sistemin denenmesi aşamasında Anadolu Üniversitesi Açıköğretim Fakültesi Öğrenme Teknolojileri AR-GE Biriminde (eski adı Bilgisayar Destekli Eğitim Birimi) çalışan, biri yüksek lisans, diğer ikisi doktora öğrencisi olan ve bu projede bursiyer olarak görev yapan üç uygulayıcıdan yararlanılmıştır.

Geliştirilen yazılım uygulayıcı grup üzerinde gerçek bağlam koşullarında uygulanmaktadır. Bu aşama, bu makalenin yazıldığı anda henüz devam etmekte olan bir aşamadır ve uygulayıcılardan elde edilen dönütler yardımıyla yazılım üzerinde iyileştirme yapılması, gerektiği durumda tasarım ilkeleri güncellenmesi ve bu sürecin güncellenmiş tasarım ilkelerine uygun bir sistem elde edilene kadar devam etmesini kapsamaktadır.

Uygulayıcıların Aralık 2014-Temmuz 2015 döneminde en az altı ay aktif olarak, başlangıçta az sayıda algılayıcıya sahip olan ve giderek artan sayıda algılayıcı içerecek

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biçimdeki yaşam günlüğü sistemi kullanmaları öngörülmüştür. Kullanıcı testlerinde uygulayıcılardan aşağıdaki davranışlar beklenmiştir. :

- Araştırma kapsamında verilen tablet bilgisayar ve kendilerine ait masaüstü ve dizüstü bilgisayarlarla Tablo 6'daki kullanım çizelgesine uygun olarak yaşam deneyimlerini yakalamak.
- Yakalanan ve OneDrive üzerinden kişisel çalışma bilgisayarına aktarılan verileri düzenli olarak yerel diske taşıyarak OneDrive'dan kaldırmak ve dış depolama birimine yedeklemek.
- Bir – iki günlük sürelerle yaşanan deneyimleri tarayarak etkinlikleri yorumlamak; bir – iki haftada bir etkinlikleri tarayarak epizodları yorumlamak; ayda bir epizodları tarayarak öyküleri yorumlamak.
- Ayda bir verileri ve kayıtları tarayarak kişiler, yerler, varlıklar, yaşam olayları vb. bağlam listelerini güncellemek.
- Öğrenme deneyimlerini yönetmek amacıyla etkinlik/olay, epizod ve öykü yorumlarını kullanmak.
- Yukarıdaki işlemleri gerçekleştirdikleri süre boyunca karşılaştıkları sorunları araştırmacıyla paylaşmak.

Etik Hususlar

Yaşam günlüğü uygulamalarında bireylerin günlük yaşamlarına ait özel verilerin kaydedilmesi söz konusu olduğundan dolayı araştırmanın mahremiyet boyutu önem kazanmaktadır. Bu nedenle aşağıdaki hususların vurgulanması gerekmiştir:

- **Kayıtlara erişim:** Araştırma kapsamında uygulayıcıların kendilerine verilen yazılımlar ve cihazlarla gerçekleştirecekleri yaşam günlüğü kayıtları sadece kendi bilgisayarlarında, kendi OneDrive hesaplarında ya da kendilerine ait taşınabilir dış bellek birimlerinde tutulacaktır ve sadece kendileri erişebileceklerdir. Araştırmacının uygulayıcıların günlük kayıtları üzerinde inceleme yapması bu çalışmanın kapsamında yer almamaktadır.

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- **Kayıtların sahipliği:** Uygulayıcılar tarafından araştırma sürecinde gerçekleştirilen günlük kayıtlarının sahipleri bireylerin kendileri olup, bu kayıtlar araştırma esnasında ya da daha sonra kendilerinden hiçbir nedenle istenmeyecektir.

- **Üçüncü şahısların kaydedilmesi:** Araştırma esnasında uygulayıcıların izinsiz olarak üçüncü şahısları kaydetmelerini engellemek amacıyla kullandıkları cihazlara "Bu bilgisayarda bilimsel araştırma projesi kapsamında ekran görüntüsü, kamera görüntüsü, ses ve video kaydı yapılmaktadır." İbaresi bulunan bir etiket yapıştırılacaktır. Toplantı ve görüşmelerde kayıt alma işlemi öncesi izin alınacaktır.

Veri Toplama Süreci ve Araçları

Araştırma sürecinde yarı yapılandırılmış görüşmeler, görüşmelere ait video kayıtları ve günlükler yoluyla veri toplama gerçekleştirilmiştir.

- **Yarı yapılandırılmış görüşmeler:** Araştırmacının uygulayıcılarla doğrudan temas kurarak uygulamayı değerlendirmesine olanak sağlayacaktır. Yarı yapılandırılmış görüşmeler tasarım tabanlı araştırma aşamasında sistemin işlevsel özelliklerinin doğru çalışıp çalışmadığı ve kullanıcı deneyimi dönütlerinin elde edilmesi amacıyla kullanılmıştır.

- **Video kayıtları:** Proje kapsamında yapılandırılmamış ve yarı yapılandırılmış görüşmelerin tümünün videoları araştırmacının yaşam günlüğü sistemiyle kaydedilmiş ve gözlem ortamının yeniden değerlendirilmesi amacıyla kullanılmıştır.

- **Günlükler:** Araştırmacı günlüğü, nitel araştırma yöntemleri ile gerçekleştirilen çalışmaların önemli veri kaynaklarından biri olup, düşünceler, gözlemler, yorumlar, açıklamalar, hipotezler ve tepkiler gibi bireysel notları içerir (Ekiz, 2003, s.160). Bu çalışmada araştırmacı ve uygulayıcılar kendi yaşam günlüğü sistemlerini kullanarak araştırmanın süreçlerine, karşılaşılan sorunlara ve işleyen yönlere ilişkin günlük tutmuşlardır. Bu günlüklerin araştırmanın tüm aşamalarında etkili bir veri kaynağı olması beklenmektedir.

Verilerin Analizi ve Sonuçların Değerlendirilmesi

- Tasarım tabanlı araştırma aşamasında başlangıç tasarımına ait olarak geliştirilmiş prototip yazılımlar uygulayıcılar tarafından kullanılmaya başlandığı andan itibaren kullanıcı deneyimi verileri toplanmaya başlanmıştır.

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- Elde edilen verilerle başlangıç tasarım ilkelerini sağlayan sisteme erişilip erişilmediği belirlenmeye çalışılmış, ayrıca başlangıç tasarım ilkeleri arasında bulunmayan yeni ilkelerin gerekliliği ortaya çıktığında var olan tasarım ilkeleri güncellenmiştir.

- Süreç, geliştirilen sistem öngörülen bütün tasarım ilkelerini karşılayana kadar devam edecektir. Bu aşama henüz devam etmektedir ve öngörülen son tarih Temmuz 2015 ayı sonudur.

Veri Büyüklükleri

Kullanıcı testlerini gerçekleştiren uygulayıcıların sisteme sık sık stres testi uygulamaları nedeniyle denemelerde elde edilen veri büyüklükleri gerçekçi değildir. Sistemin, herhangi bir anda sadece bir cihaz kullanıldığı durumda, yakalayacağı günlük verisi büyüklükleri Tablo 8'deki gibi öngörülmektedir:

Tablo 8: Veri büyüklükleri

Günlük verisi	Büyüklük
Ekran ve kamera görüntüsü	Günde ortalama 16 saat süresince 1920 ekran görüntüsü ve 1920 kamera görüntüsü yakalanacaktır. Her görüntü için üst büyüklük 100 KB alınırsa günde 384 MB; 6 ayda (180 gün) 69,12 GB yer kaplayacaktır.
Ekran ve kamera videosu	Günde ortalama 2 saat ekran videosu, 2 saat kamera videosu kaydedilmesi öngörülmektedir. Dakikası 10 MB kalitesinde ekran videosu görüntüsü günde 1.2 GB; 180 günde ise 216 GB yer kaplayacaktır. Dakikası 10 MB kalitesinde kamera videosu günde 1.2 GB; 180 günde 216 GB yer kaplayacaktır.
Ses	Günde ortalama 2 saat ses kaydedilmesi öngörülmektedir. Dakikası 2 Mb kalitesinde ses günde 240 MB; 180 günde 43.2 GB yer kaplayacaktır.
Konum	Fiziksel ortam bilgileri günde ortalama16 saat süresince 1920 kez yakalanacak ve her kayıt için en fazla 1 KB büyüklüğünde bir dosya kaydedildiğinde günde 1,92 MB; 180 günde 0,6 GB yer kaplayacaktır.

Böylece uygulama süresince her uygulayıcının 6 ayda en fazla toplam 544,92 GB veri yakalaması öngörülmektedir. Bu verileri yedeklemek için 1 TB kapasiteli dış depolama birimleri yeterli olacaktır.

SONUÇ VE ÖNERİLER

Yaşam günlüğü araçlarıyla öğrenme deneyimlerinin yakalanması 2010'lu yıllarda önem kazanmaya başlamıştır: Örneğin MIRROR (Müller vd., 2011) ve TRAILER (Peñalvo vd., 2012) isimli Avrupa Birliği 7. Çerçeve ve Yaşamboyu Öğrenme projelerinde bireylerin öğrenme deneyimlerini yakalamak ve değerlendirmek amacıyla sistemler tasarlanmaktadır. Diğer taraftan biçimsel ve yarı biçimsel öğrenme ortamlarında özellikle sınıf içi etkinliklerin yaşam günlüğü araçlarıyla kaydedilmesi amacıyla çeşitli araştırmalar yapılmaktadır (Ogata vd., 2011). Bir başka çalışmada yaşam deneyimlerini daha sonra incelendiğinde hatırlamak ve biçimsel olmayan öğrenme deneyimlerini bunların içerisinden çıkarmak için sanal ortamlarda bilgisayar ekranı görüntüsü kaydetme, fiziksel ortamlar için taşınabilir bilgisayar kamerasıyla

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görüntü kaydetmeye dayalı bir yaklaşım geliştirilmiş ve uygulanmıştır (Mutlu, 2015a; Mutlu vd., 2015).

Bu çalışmada ise yaşam genişliğinde öğrenme deneyimlerinin yakalanması, yorumlanması ve yönetilmesine destek vermek amacıyla, öğrenme deneyimlerinin yanı sıra öğrenme içeriklerini de yakalayabilecek bir yaşam günlüğü sistemi tasarlanmıştır. Kuramsal çerçeveden elde edilen tasarım ilkeleri doğrultusunda ilk sürümleri geliştirilen sistemin uygulayıcılar üzerinde kullanıcı testleri sürekli olarak gerçekleştirilmiş, bu süre boyunca uygulayıcılardan elde edilen dönütler yardımıyla sistem hatalardan ayıklanmış ve iyileştirmeler yapılmıştır. Bu süreç sonunda araştırmada tanıtılan deneyim yakalama uygulamaları ve deneyim görüntüleme/yorumlama uygulamasının tasarım ilkelerine uygun olarak çalışan prototip sürümleri elde edilmiştir. Bu süreç Temmuz 2015 sonuna kadar devam edecektir. Tasarım tabanlı araştırmada Mayıs 2015 başındaki durum aşağıda özetlenmiştir:

- Geliştirilen sistem günlük yaşam deneyimlerini pasif olarak yakalayabilmekte ve öğrenme deneyimlerine ait içeriklerin aktif olarak yakalanmasına olanak sağlamaktadır.
- Deneyimleri görüntüleyerek gün boyunca yaşanan deneyimlerin farkedilmesi ve üzerinde çalışılan içeriğe erişilmesi için olanak sağlanmıştır.
- Öğrenme deneyimlerine ait etkinlik/olay, epizod ve öykü yorumları oluşturulabilmektedir. Bu yorumlarla geçmiş, güncel ve geleceğe ait öğrenme deneyimlerinin planlanması, denetlenmesi ve değerlendirilmesine olanak sağlanmaktadır.
- Deneyimlere ait bağlamlar, kişisel bilgi tabanına girilerek, deneyimler, içerikler ve bağlamlar arasında ilişkiler kurulabilmektedir.

Uygulanan öğrenme deneyimleri yaklaşımının kuramsal çerçevesini geliştirmek amacıyla daha ileri çalışmalar gerçekleştirilebilir. Potansiyel çalışmalara örnek olarak, deneyimlere anlam verme (sense making) ve deneyim portfolyosu oluşturma sürecinin araştırılması; öğrenme deneyimlerini yönetme ve üst biliş ilişkisinin araştırılması verilebilir.

Geliştirilen sisteme daha ileri teknik özellikler kazandırılması amacıyla yeni çalışmalar gerçekleştirilebilir. Bu çalışmalar arasında, deneyimleri yakalama işlevinin ortam duyarlı ve daha zeki hale getirilmesi, deneyimleri görüntüleme seçeneklerinin artırılması; yüz tanıma,

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nesne tanıma, yer tanıma, yazı tanıma, ses tanıma vb. ileri örüntü tanıma teknikleri yardımıyla deneyimleri yorumlama sürecinin geliştirilmesi; deneyimleri canlı olarak yazılı yorumlamanın yanı sıra, sesli, videolu ve görüntülü yorumlama olanağı kazandırılması; gelişmiş bulut hizmetleri yardımıyla deneyim görüntüleme ve yorumlama olanağının mobil ortama taşınması; deneyimler, içerikler ve bağlamlar arasında semantik ağ oluşturulması sayılabilir.

Geliştirilen sistem yaşam genişliğinde öğrenme deneyimlerinin yönetimi için bir altyapı sunmaktadır. Bu altyapı kullanılarak yaşam genişliğinde öğrenme deneyimlerinin yönetilebilirliği araştırılabilir. Bu amaçla, projenin izleyen bölümünde 6-8 gönüllü katılımcıdan oluşan bir uygulayıcı grubu üzerinde durum çalışması yöntemiyle bir araştırma gerçekleştirilmesi planlanmıştır.

TEŞEKKÜRLER

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Pedagojik Formasyon Eğitimi Öğretmen Adaylarının Teknopedagojik Eğitim Yeterliliklerinin Çeşitli Değişkenler Açısından İncelenmesi

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ÖZET

Bu çalışmanın amacı, pedagojik formasyon eğitimi öğretmen adaylarının, öğretim ortamında etkin teknoloji kullanımı olarak tanımlanan Teknolojik Pedagojik Alan Bilgisi (TPAB) yeterliliklerinin incelenmesidir. Araştırmanın çalışma grubunu 2014-2015 Eğitim Öğretim yılında Ahi Evran Üniversitesinde Pedagojik Formasyon Eğitimi alan 86'sı kız ve 143'ü erkek olmak üzere toplam 229 öğretmen adayı oluşturmaktadır. Araştırmada veri toplama aracı olarak (Şahin, 2011) tarafından Türkçeye uyarlanan "Teknolojik Pedagojik Alan Bilgisi" ölçeği kullanılmıştır.
Bu ölçme aracı ile öğretmen adaylarının cinsiyetlerine ve yaş gruplarına göre TPAB yeterlilik puan ortalamaları arasında istatistiksel olarak anlamlı bir fark olup olmadığı araştırılmıştır. Verilerin analizinde Kruskal Wallis ve Mann-Whitney U testleri yapılmıştır. Araştırma sonuçlarına göre öğretmen adaylarının TPAB yeterlik düzeylerinin orta düzeyde olduğu yaş gruplarına göre puan ortalamaları arasında istatistiksel olarak anlamlı bir farklılık olduğu, cinsiyetlerine göre ise teknoloji bilgisi alt boyutu dışında anlamlı bir farklılık olmadığı görülmüştür. TPAB puan ortalamaları yaş grupları bakımından 24 ve altı yaş grupları ile 25 ve üstü yaş grupları arasında 25 ve üstü yaş grubu lehine anlamlı fark bulunmuştur. Elde edilen sonuçlara göre, eğitim öğretim faaliyetlerinin düzenlenmesine ve geleceğe dönük araştırmalara yönelik çeşitli öneriler sunulmuştur.
Anahtar Kelimeler: TPAB, yeterlilik, pedagojik formasyon eğitimi öğretmen adayları

GİRİŞ

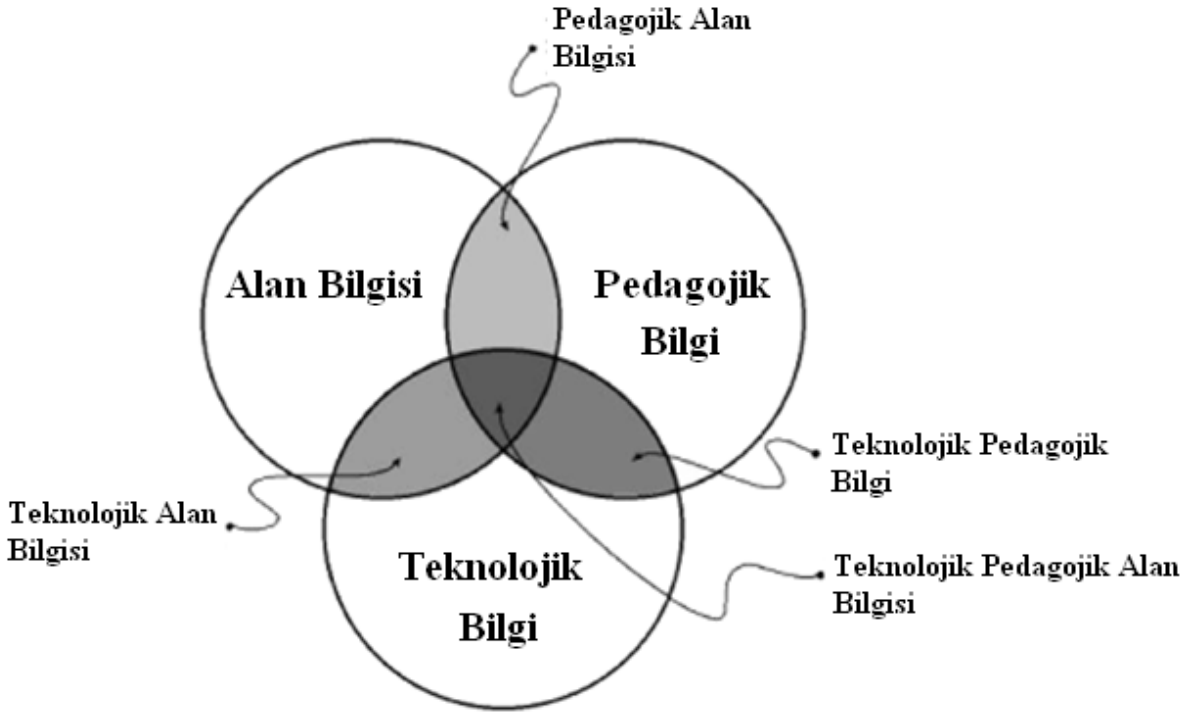
Teknolojinin hızlı bir şekilde gelişim gösterdiği çağımızda öğretmenlerin teknolojiyi eğitim öğretim faaliyetlerinde verimli bir şekilde kullanması gerekmektedir. Bilgi ve iletişim teknolojilerinin eğitim ve öğretim ortamlarındaki öneminin her geçen gün arttığı çağımızda nitelikli bir öğretmenin sahip olması gereken özelliklerden birisi alanı ile ilgili üst düzey bilgiye sahip olmasının yanısıra öğrenme-öğretme sürecinde bilgi ve iletişim teknolojilerini verimli bir şekilde kullanabilecek yeterliğe sahip olmasıdır. Pedagojik alan bilgisi öğretmenin alanı ile ilgili sahip olduğu bilgiyi nasıl öğreteceğidir (Shulman,1986). Pedagojik alan bilgisine teknoloji bilgisinin ilave edilmesi ise teknolojik pedagojik alan bilgisi olarak ortaya çıkmıştır (Mishra ve Koehler, 2006; Koh ve diğ., 2010).

Öğretmenlerin sahip olması gereken bilgi, beceri ve yeterlilikleri zaman içerisinde sürekli güncellenmiştir (Ömer Şimşek, Servet Demir, Birsen Bağçeci, 2013). Teknolojinin hayatın hemen hemen tüm alanlarında olduğu gibi eğitimde de çok sık kullanılması nedeniyle öğretmenlerin ve öğretmen adaylarının teknolojiyi öğretimde kullanımına yönelik bilgi ve

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becerilere sahip olmaları gerektiği (Öztürk ve Horzum, 2011) ile ilgili olarak akademik araştırmalar ve öneriler yapılmıştır.

Russel ve arkadaşları (2003) öğretmenlerin teknolojiyi daha çok derse hazırlık ve iletişim aracı olarak kullandıklarını, öğretimi ya da öğrenme etkinliklerini tasarlamada etkin olarak kullanmadıklarını belirtmişlerdir. Entegrasyon modellerinin teknoloji odaklı modellerden pedagojik odaklı modellere doğru bir değişim gösterdiği görülmektedir. Diğer bir ifadeyle, teknoloji odaklı modeller, öğretmenlerin teknoloji kullanımına ilişkin bilgi ve beceriler edinmelerini hedeflerken, pedagoji odaklı modeller ise öğretmenlerin öğretim suresinde teknoloji kullanım bilgilerini pedagoji bilgileri ile ilişkilendirmelerini hedefleyen modellerdir. Eğitimde teknoloji entegrasyonu ile ilgili pedagoji odaklı modellerden biri ise, Teknolojik Pedagojik içerik Bilgisi-TPIB (Technological Pedagogical Content Knowledge-TPACK) modelidir (Yurdakul, 2011).



Şekil 1. TPAB Çerçevesi (Koehler ve Mishra, 2005)

TPAB teknoloji bilgisi, pedagojik bilgi ve alan bilgisi olmak üzere üç temel bileşenden oluşmaktadır. Alan bilgisi, öğretilecek ders içeriği ile ilgili bilgidir (Harris ve diğ., 2007). Pedagoji bilgisi; öğretim süreci, uygulama ve yöntem bilgisidir (Mishra ve Koehler, 2006). Teknoloji bilgisi ise; yeni teknolojik gelişmeleri takip etme ve oryantasyon, her alanda teknolojinin kullanımı ve teknoloji okuryazarlığıdır (Schmidt ve diğ., 2009).

Öğretmen adaylarının teknoloji ile ilgili yeterli bilgiye sahip olmaları TPAB'lerinin gelişmesine yetmez bu yüzden derslerde Soong ve Tan (2010)'nında belirttiği gibi teknolojinin öğrenme-öğretme faaliyetleri ile bütünleştirilmesini sağlayacak TPAB'a yönelik uygulamalar geliştirilmelidir.

Alanyazın incelendiğinde Eğitim Fakültesi öğrencilerinin TPAB'lerine yönelik pek çok araştırma yapılmışken Pedagojik Formasyon eğitimi alan Fen Edebiyat Fakültesi, Beden Eğitimi Spor Yüksekokulu, Sağlık Yüksekokulu öğrencileri ile igili az sayıda çalışma yapıldığı görülmektedir. Bunun yanısıra, TPAB'nin incelenmesi ve daha iyi değerlendirilmesi gerektiğine vurgu yapılmaktadır (Archambault & Crippen, 2009; Cox & Graham,2009). Ayrıca Yavuz-Konokman, Yanpar-Yelken, & Sancar-Tokmak (2013)'ında belirttiği gibi öğrenme ortamlarının tasarımcısı olan öğretmenlerin yeterince TPAB'sine sahip olmaları gerektiğinden öğretmen adaylarının TPAB düzeylerinin belirlenmesi oldukça önemlidir. Bu anlamda, öğretmen adaylarının teknopedagojik yeterliklerinin belirlenerek çeşitli değişkenler açısından farklılaşıp farklılaşmadığına yönelik istatistiksel bir takım verilerin alana katkı sağlayacağı düşülmektedir.

Bu araştırmada TPAB ölçeği ve kişisel bilgi formu kullanılarak, Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB'lerine yönelik yeterlikleri ve bu yeterliklerinin cinsiyet ve yaş faktörlerine göre farklılaşıp farklılaşmadığı araştırılmıştır. Bu genel amaç doğrultusunda asağıdaki alt amaçlar belirlenmistir:

1.Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB düzeylerine ilişkin algıları nedir?

2.Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB'leri ile demografik özellikleri cinsiyet ve yaşa göre anlamlı bir farklılık göstermekte midir?

Yöntem

Pedagojik Formasyon Eğitimi öğretmen adaylarının teknolojik pedagojik alan bilgisi (TPAB) yeterlilik düzeyleri ve bu yeterlilik düzeylerinin cinsiyet ve yaş gruplarına göre farklılaşıp farklılaşmadığının belirlenmesinin amaçlandığı bu çalışmada betimsel tarama modeli kullanılmıştır.

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Çalısma Grubu

Araştırmanın çalışma grubunu 2014-2015 eğitim-öğretim yılında Ahi Evran Üniversitesi Eğitim Fakültesi'nde Pedagojik Formasyon Programına kayıtlı Fen Bilimleri, Sağlık Bilimleri ve Sosyal Bilimler mezunu öğretmen adayları olusturmaktadır. 229 öğretmen adayına web ortamında geliştirilen bir form ve anket dağıtımı yolu ile ulaşılmıştır. Çalışma grubunun cinsiyet ve yaşa göre dağılımı Tablo 1'de özetlenmiştir.

Tablo 6. Pedagojik Formasyon Eğitimi Öğretmen Adaylarının Demografik Özellikleri

Değişken	Özellik	f	%
Cinsiyet	Erkek	86	37,6
	Kadın	143	62,4
Yaş	21 ve altı	29	12,7
	22-24	134	58,5
	25-27	35	15,3
	28 ve üstü	31	13,5
Toplam		229	100

Verilerin Toplanması ve Analizi

Bu çalışmada veri toplama aracı olarak Şahin (2011) tarafından Türkçeye uyarlanan, yedi tane alt boyutu olan ve 47-maddeden oluşan beş kategorili Likert tipi Teknolojik Pedagojik İçerik Bilgisi Ölçeği kullanılmıştır. Ölçeğin alt boyutlarına ait iç tutarlık katsayıları (Cronbach Alpha); TB alt boyutunda .80, PB alt boyutunda .82, AB alt boyutunda .79, TPB alt boyutunda .77, TAB alt boyutunda .79, PAB alt boyutunda .84 ve tüm ölçek için iç tutarlılık katsayısı ise 0.86 olarak hesaplanmıştır. Ölçek maddeleri, 5'li likert tipi olup "Hiç bilmiyorum", "Az düzeyde biliyorum", " Orta düzeyde biliyorum ", " İyi düzeyde biliyorum " ve " Çok iyi düzeyde biliyorum " şeklindedir.

Verilerin istatistiksel analizinde SPSS 20 (The Statistical Package for The Social Sciences) paket programından yararlanılmıştır.

Veriler parametrik test varsayımlarını karşılamadığı için analiz işlemlerinde non-parametrik testlerden yararlanılmıştır. Bu kapsamda elde edilen verilerin analizi sürecinde; betimsel istatistikler olarak frekans (f), yüzde (%), ortalama (X) ve standart sapma (Ss) değerleri, açımlayıcı istatistik tekniklerinde ise Kruskal Wallis ve Mann-Whitney U testleri kullanılmıştır.

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Veri analizi sonrasında elde edilen bulguların yorumlanmasında kullanılan değerlendirme ölçeğinde; (5-1) / 5 değerlendirme aralığı temel alınmış ve ortalama puan sınırları ile bilgi seviyeleri arasındaki ilişki Tablo 2'de gösterilmiştir.

Tablo 2. Maddeleri Değerlendirme Kriterleri

Seçenek	**Ağırlık**	**Sınırları**
Hiç bilmiyorum	1	1.00 – 1.80
Az düzeyde biliyorum	2	1.81 – 2.60
Orta düzeyde biliyorum	3	2.61 – 3.40
İyi düzeyde biliyorum	4	3.41 – 4.20
Çok iyi düzeyde biliyorum	5	4.21 – 5.00

BULGULAR

Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB ve tüm alt boyutlarına göre puan ortalamalarına ilişkin elde edilen betimsel istatistik sonuçları Tablo 3'de verilmiştir.

Tablo 3. Pedagojik Formasyon Eğitimi Öğretmen Adaylarının TPAB Puanlarına İlişkin Betimsel İstatistik Sonuçları

	N	En Küçük	En Büyük	X	Ss
Teknolojik_B	229	2,20	5,67	4,0399	,78823
Pedagojik_B		1,33	5,00	3,1994	,77549
Alan_B		1,33	5,00	3,4207	,68444
Teknolojik_Pedagojik_B		1,00	5,00	3,3144	,81847
Teknolojik_Alan_B		1,00	5,00	3,1801	,84749
Pedagojik_Alan_B		1,29	5,00	3,3319	,76171
Teknolojik_Pedagojik_Alan_B		1,40	5,00	3,2603	,75559
Genel_Ort		1,58	5,10	3,3924	,67433

Tablo 3'e göre Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB puan ortalamarı incelendiğinde (X=3.39) TPAB'lerinin orta düzeyde olduğu görülmektedir. TPAB alt boyutlarına göre incelendiğinde ise; Pedagojik Formasyon Eğitimi öğretmen adaylarının Teknolojik Bilgilerinin (X=4.04) ve Alan Bilgilerinin (3.42) iyi düzeyde olduğu Pedagoji Bilgilerinin, Teknolojik Pedagojik Bilgilerinin, Teknolojik Alan Bilgilerinin, Pedagojik Alan Bilgilerinin ve Teknololik Pedagojik Alan Bilgilerinin ise orta düzeyde olduğu anlaşılmaktadır.

Öğretmen Adaylarının Cinsiyetlerine Göre TPAB Yeterlik Düzeyleri

Öğretmen adaylarının TPAB'nde cinsiyetlerine göre anlamlı bir farklılık olup olmadığını ölçmek için yapılan Mann-Whitney U testi sonuçlarına Tablo 4'de yer verilmiştir.

Tablo 4. Pedagojik Formasyon Eğitimi Öğretmen Adaylarının Cinsiyetlerine Göre TPAB Ortalama Puanlarına İlişkin Mann Whitney U Testi Sonuçları

Cinsiyet	N	Ortalama Dağılım							
		Tekn Bil.	Pedagojik Bil.	Alan Bil.	Tekn Ped. Bil.	Tekn Alan Bil.	Ped. Alan Bil.	Tekn.Ped Alan Bil.	Genel
Erkek	86	135,10	112,53	123,14	122,48	122,16	113,95	119,57	121,49
Kadın	143	102,91	116,49	110,10	110,50	110,69	115,63	112,25	111,10
Mann Whitney U		4420	5936,5	5449	5505,5	5533	6059	5756	5591
Z		-3,563	-,439	-1,448	-1,336	-1,283	-,186	-,815	-1,149
p		,000 *	,660	,148	,182	,199	,852	,415	,250

*p<=.05

Pedagojik Formasyon eğitimi öğretmen adaylarının cinsiyetlerine göre TPAB ortalama puanları incelendiğinde; teknolojik bilgilerinde (U=4420) anlamlı bir fark (p.<=.05) olduğu belirlenmiştir. Araştırmaya katılan 86 erkek öğretmen adayının ortalaması 135.10 iken kız öğretmen adaylarının ortalaması 102.91 olarak hesaplanmıştır. Araştırmaya katılan erkek öğretmen adaylarının teknoloji bilgisinin kız öğretmen adaylarının puanlarından daha yüksek olduğu görülmektedir. Bunun aksine pedagojik bilgileri (U=5936.6), alan bilgileri (U=5449), teknolojik pedagojik bilgileri (U=5505.5), teknolojik alan bilgileri (U=5533), pedagojik alan bilgileri (U=6059) ve teknolojik pedagojik alan bilgileri bakımında (U=5756) cinsiyetlerine göre istatiksel olarak anlamlı (p.>.05) bir farklılığa sahip olmadıkları belirlenmiştir.

Öğretmen Adaylarının Yaş Gruplarına Göre TPAB Yeterlik Düzeyleri

Öğretmen adaylarının TPAB'lerinin farklı yaş gruplarına göre anlamlı bir farklılık gösterip göstermediğini belirlemek için Kruskal Wallis testi sonuçlarına bakılmıştır.

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Tablo 5. Pedagojik Formasyon Eğitimi Öğretmen Adaylarının Yaş Grupları Göre TPAB Ortalama Puanlarına İlişkin Kruskal Wallis Testi Sonuçları

Yaş Aralığı	N	Ortalama Dağılım							
		Tekn Bil.	Pedagojik Bil.	Alan Bil.	Tekn Ped. Bil.	Tekn Alan Bil.	Ped. Alan Bil.	Tekn.Ped Alan Bil.	Genel
21 ve altı	29	122,43	127,83	100,28	119,53	120,6	122,05	113,64	120,43
22 – 24	134	105,78	103,49	105,6	103,95	105,04	102,66	105,27	102,69
25 -27	35	128,09	123,23	135,87	132,47	132,69	138,17	129,76	133,41
28 ve üstü	31	133,13	143,48	145,82	138,79	132,85	135,58	141,68	142,32
Kruskal Wallis Chi-Square ($\chi 2$)		6,652	11,497	14,427	10,456	8,166	12,336	9,798	12,795
Z		3	3	3	3	3	3	3	3
p		,084	,009 *	,002 *	,015 *	,043 *	,006 *	,020 *	,005 *

*p<=.05

Tablo 5'de öğretmen adaylarının yaş gruplarına göre TPAB ortalama puanları incelendiğinde en yüksek ortalama 142.32 puan ortalaması ile 28 ve üstü yaş grubu öğretmen adaylarına aittir. En düşük ortalama ise 102.69 puan ortalaması ile 22-24 yaş grubu öğretmen adaylarına aittir. Öğretmen adaylarının TPAB'nde yaş gruplarına göre anlamlı bir farklılaşmanın olup olmadığını ölçmek için gerçekleştirilen Kruskal Wallis testi sonuçlarına göre yaşın öğretmen adaylarının TPAB puanlarında anlamlı bir farklılık oluşturduğu anlaşılmaktadır. Farklılık 25-27 ve 28 ve üstü yaş gruplarının lehinedir. TPAB puanları alt boyutlarına göre incelendiğinde ise; gruplar arasında teknoloji bilgisi puanlarında ($\chi 2$=6.652; p>.05) anlamlı bir farklılık olmamasına karşın diğer tüm alt boyutlarda anlamlı bir faklılık olduğu görülmektedir. Bu sonuç yaş faktörünün öğretmen adaylarının TPAB düzeyleri üzerinde doğru orantılı bir artış gösterdiği yönündedir.

TARTIŞMA ve SONUÇ

Bu çalışmanın amacı, pedagojik formasyon eğitimi öğretmen adaylarının TPAB yeterlik düzeylerini ölçmek ve TPAB puanlarının cinsiyet ve yaş gruplarına göre anlamlı bir farklılık gösterip göstermediğini belirlemektir. Veriler, betimsel istatistik, Mann Whitney U testi ve Kruskal Wallis yöntemleri ile analiz edilmiştir.

Araştırma sonuçlarına göre, Pedagojik Formasyon Eğitimi öğretmen adaylarının TPAB ortalama puanı 3.39 olarak bulunmuştur ve bu puan katılımcıların TPAB'lerinin orta düzeyde olduğu anlamına gelmektedir. Bu konuda literatür tarandığında Pedagojik Formasyon Eğitimi

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alan öğretmen adayları ile ilgili olarak yapılmış çok az sayıda çalışmaya rastlanmaktadır. Ancak Eğitim fakültelerinden mezun öğretmen adayları ile ilgili çok sayıda çalışma bulunmaktadır. Yapılan çalışmalardan elde edilen sonuçlar Eğitim Fakültelerinden mezun öğretmen adaylarının TPAB ortalama puanlarının Pedagojik Formasyon Eğitimi öğretmen adaylarının aksine "iyi" yada "yüksek" olduğu yönündedir. Yavuz-Konokman ve diğ. (2013) de Sınıf Öğretmeni adaylarının TPAB düzeylerinin yüksek olduğunu belirtmişlerdir. Yine aynı şekilde Gömleksiz ve Fidan (2013) Sınıf Öğretmeni adaylarının TPAB öz yeterliklerine ilişkin yaptıkları çalışmada hem kadın hem erkek öğretmen adaylarının kendilerini teknoloji bilgisi alt boyutunda yeterli gördüklerini ifade etmektedirler. Literatürde benzer sonuçları destekleyen çok sayıda araştırmaya rastlamak mümkündür (Haşlaman, Kuşkaya-Mumcu ve Usluel, 2007) öğretmen adaylarının teknopedagojik alan bilgileri konusunda yaptıkları çalışmada öğretmen adaylarının kendilerini ileri düzeyde yeterli gördüklerini belirtmişlerdir. Kabakçı Yurdakul (2011)'un 3105 öğretmen adayı üzerinde yaptığı bir çalışmada da öğretmen adaylarının teknopedagojik eğitim yeterliği açısından kendilerini ileri düzeyde gördüklerini belirtmişlerdir.

Araştırmada öğretmen adaylarının teknoloji bilgileri dışında tüm alt boyutlarda (PB, AB, TPB, TAB, PAB, TPAB) cinsiyetlerine göre TPAB puan ortalamaları arasında istatistiksel bir fark bulunamamıştır. Cinsiyete göre anlamlı farklılık sadece teknoloji bilgilerinde ortaya çıkmıştır. Buradan erkek öğretmen adaylarının teknoloji bilgisi konusunda kız öğretmen adaylarına göre kendilerini daha yeterli gördükleri sonucunu çıkarabiliriz. Aynı şekilde Şimşek ve diğ. (2013) öğretim elemanlarına ilişkin yaptıkları bir araştırmada öğretim elemanlarının cinsiyetlerine göre TPAB puan ortalamalarında anlamlı bir farklılık olmadığını belirtmişlerdir. Yine aynı doğrultuda Koh ve Chai (2011) ve Jong ve Tsai, (2012) de cinsiyete göre TPAB puanlarında farklılık olup olmadığını araştırdıkları çalışmalarında cinsiyet bakımından TPAB puanlarında anlamlı bir farklılık bulunmadığını belirtmişlerdir. Meriç (2014)' de yaptığı bir çalışmasında öğretmen adaylarının TPAB'nden elde ettikleri puanların cinsiyet değişkenine göre anlamlı bir farklılık göstermediğini ifade etmişlerdir. Bu sonuçların aksine TPAB puan düzeylerinin cinsiyete göre farklılaştığı sonucuna ulaşan bazı çalışmalarda vardır. Örneğin Chai, Koh ve Tsai (2010) 1185 öğretmen adayının TPAB'larına ilişkin yaptıkları cinsiyete göre bazı farklı bulgulara ulaşmışlardır.

Araştırma sonuçları yaş gruplarına göre öğretmen adaylarının TPAB puan ortalamaları arasında istatistiksel olarak anlamlı bir farklılık olduğunu göstermektedir. En yüksek puan ortalamasına 28 ve üstü yaş grubu sahip iken en düşük puan ortalaması 22 – 24 yaş grubu için

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hesaplanmıştır. Farklılık 28 ve üstü yaş grubu ile 25-27 yaş grubu öğretmen adaylarının lehinedir. Buradan daha üst yaş grubu öğretmen adaylarının daha yüksek TPAB'ne sahip olduklarını söyleyebiliriz. Aynı şekilde Lee ve Tsai'nin (2010) daha yaşlı ve deneyimli öğretmenlerin TPAB-Web öz yeterlilik seviyelerinin genç öğretmenlere göre daha az olduğunu belirtmişlerdir. Ancak Sabo ve Archambault (2012)'un öğretmenlere ilişkin yaptıkları bir çalışmalarında 21-29, 20-39, 40-49 ve 50-59 yaş grubundaki öğretmenlerin TPAB puan ortalamaları arasında anlamlı bir fark bulunmadığını belirtmişlerdir.

Sonuç olarak Fen Bilimler, Sağlık Bilimler ve Sosyal Bilimler mezunu öğretmen adaylarının TPAB puan ortalamaları yaş gruplarına göre tüm alt boyutlarda istatistiksel olarak anlamlı bir farklılık gösterirken cinsiyete göre teknoloji bilgisi alt boyutu dışında diğer hiçbir alt boyuta göre anlamlı farklılık göstermemektedir. Ayrıca Pedagojik Formasyon Eğitimi alan öğretmen adaylarının TPAB puan ortalamalarının orta düzey olduğu tespit edilmiştir.

Araştırma bulgularına göre, Pedagojik Formasyon Eğitimi alan öğretmen adaylarının TPAB'lerinin geliştirilmesi gerektiğinden yola çıkarak aşağıdaki önerilerde bulunulabilir:

1. Eğitim Fakülteleri, Fen Edebiyat Fakülteleri ve Sağlık Bilimleri mezunu öğretmen adaylarının TPAB yeterlik düzeylerinin birlikte incelendiği daha geniş kapsamlı bir çalışma ile daha kesin sonuçlar elde edilebilir.

2. Pedagojik Formasyon Eğitimi derslerinde, Soong ve Tan (2010)'nın belirttiği gibi öğretim sürecinde teknolojinin daha etkin kullanımını destekleyecek TPAB'ne yönelik uygulamalar yapılıp bu uygulamaların öğretmen adaylarının TPAB düzeylerini nasıl etkilediği araştırılabilir.

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Perspectives Of Online Professional Foreign Language Learning In Polytechnic Universities

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Abstract
This paper deals with the first steps of online courses implementation in higher education. Nowadays modern higher universities should be more flexible to be competitive. For this reason, higher education institutions face to online education platforms. In this paper the usage of an education platform called Coursera will be described. However, to choose the best education model suitable for your teaching materials several online education courses should be tested for students' preparedness estimation. In this study several students of polytechnic universities are asked to choose one online course in English (the first foreign language) presented in Coursera according to their professional learning direction to examine if the students can complete the course successfully.

INTRODUCTION

Today information technologies (IT) play a great role in every sphere of our society. Only in the last years changers in information technologies let to changers in understanding up-to-date ways of study, work and life. "Our professional life is changed because of the changes in the requirements of contemporary society. Many tools that we use in our daily life are changed with technological development" (Koçoğlu et al., 2014, p. 149). Thus, to stay competitive in the education world Higher Education Institutions should be very flexible. It is clear that teaching process should use these information technologies as we live in IT century. That's why this flexibility can be achieved by means of online learning. In the last decades students' participation in online learning has increased greatly. It is known that up-to-date information technologies caused information revolution in the second half of the XX century and resulted in a great development of distance learning aimed at providing access to university learning recourses. Remote access means information accessibility for students and teachers at any time. It also helps to take part in webinars and improve educational level within refreshing and postgraduate courses. Due to Margarida Romero, "online universities allow greater flexibility in terms of time and space and offer distance-based activities supported through a Computer Learning Environment" (Romero, 2014). But the transition process from class learning/teaching to online learning/teaching is not simple not only for students but lecturers. As they have to be ready to create such courses or to teach with them. Therefore, Universities should change their teaching models to involve more students in the learning process.

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Moreover, university's reputation depends on the quantity and quality of presented online courses, online students, as progressive organizations should use up-to-date technologies and innovations (Pundak, 2015).

Modern students are very interested in the usage of distant technologies. That's why the way of teaching English as a second language is more effective and productive when it allows using different distant educational platforms. Most of such platforms have a strict structure and a step-by-step guide for tasks operation. These platforms can also be used in classes but taking into consideration that the number of hours for classroom training is limited, it is efficient to use online recourses for individual study.

Nowadays many scientists discuss the problem of online education. It is thought to be a flexible training in online educational milieu where the main element is knowledge availability. The aim of online education is to make educational process more effective by means of some factors:

- individual level of training;
- individual speed of training;
- free access to material at any time and place;
- materials usage of open world universities.

Traditional education oriented only on printed books and face-to-face contact with lecturers can give less content knowledge in comparison with online education. If only printed books are used during teaching, we can say that training process is not full. The usage of online recourses helps lecturers to present more interesting materials based on student's language level, study speed and to use different approaches to teach new vocabulary and grammar.

It also can assist with the problem of youth migration from the regions where there are no universities and institutes. Today students can obtain a higher education without leaving their home regions via the internet. Nikolaev A.B. in his paper writes that The State Polar Academy in St. Petersburg has presented about 250 state-financed posts for prospective university students since 2011. Thus, they can obtain education without leaving their regions (Nikolaev, 2013).

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In Russia many mature citizens are in need of yearly refresher courses for promotion. As they have families and full-time jobs they need online learning instead of face-to-face learning. Thus, many universities use an online environment to solve this problem. Students are given the material which must be studied, after it they receive achievement tests. In a few days they receive feedback to their responses and they have an opportunity to correct wrong answers.

LEARNING ENVIRONMENT

Nowadays learning of foreign languages is one of the main priorities in polytechnic universities. In the light of globalization university graduates should know a foreign language for their efficient implementation of professional activities in national and international labor markets. Thus, newly graduated engineers from Polytechnic University must have not only professional skills but also foreign language skills for professional international communication and their further education. Nowadays students take more responsibilities for their professional learning so they are more motivated. Due to the curriculum engineering bachelor students study General English (first - fourth semesters) and Professional English (fifth - eighth semesters) and engineering master students study Professional English for an academic year. The amount of class hours has decreased but the amount of hours for independent work has increased. That is why student and teacher's relations should be changed greatly. The process of teaching expands the classroom activity as students continue to learn outside their classrooms with the help of distant learning platforms/online learning courses. Today teachers of foreign languages use MOOC possibilities to make foreign language study more interesting. MOOC or Massive Open Online Courses are online courses used by a large group of students from different countries. These courses are developed by qualified lecturers from leading Universities. Open online courses consist of "teaching videos, supplemented by a various means of interaction and communication space; design concept consider the learners as the center" (Ma et al., 2014, p. 164). These courses are very informative as they contain a large variety of different materials such as books, videos, software programs and so on. The key element of such courses is an active participation in forums where students can discuss their learning problems, learning experience and etc. The duration of such courses varies from a few weeks to a full semester. After successful course completion students receive certificates (Pundak, 2014). MOOCs are considered to be an innovative way of teaching as these courses create life-long learning.

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In this study we want: 1) to examine the students' readiness to take an active part in online massive courses; to find the ways of implementation online teaching in our curriculum. This study was carried out in Tomsk Polytechnic University during one semester in the academic year 2014-2015. Students were suggested to complete one online course presented in Coursera. Then they were suggested to answer some questions in the survey.

METHODS OF STUDY

Participants

The participants in the study were 48 individuals: 33 fourth-year students, 10 third-year students and 5 master students from Polytechnic University. They were suggested to take part in an online course presented in Coursera instead of their traditional course – Professional English. The students' task was to choose a course according to the future professional field in English (English is a foreign language for them). The aim of the study is to investigate students' ability to complete the course and to understand the difficulties which students might have during it; to study what courses (onsite or online) are more preferable. Forty eight students agreed to take part in the study. The key element for taking part in this study was the language level of English. It must be upper-intermediate or advanced.

Data collection tool

At the end of the semester students received a questionnaire which should be filled anonymously. Specifically, the respondents were asked the following questions:

1) Are you satisfied with a chosen online course?

2) Have you got a sufficient background level in a professional field to complete the course? Have you got a sufficient language level of a foreign language to complete the course?

3) What difficulties did you have during online learning?

4) What online courses would you like to take at our University?

The study allows investigating students' opinions about online courses and their implementation in academic education process.

STUDY RESULTS

Results show that only 24 participants (4 third-year students, 16 fourth-year students and 4 master students) could complete a chosen course successfully.

A. Students' satisfaction

The majority of students (42 out of 48) are satisfied with their chosen courses as they can get much information through the internet. The main reason of their satisfaction is schedule

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flexibility as most of them have a part-time job. Some male respondents (7 students) note that they enjoyed the course as they are very interested in online technologies. All master students are satisfied with their online courses as they had an independent learning pace and could study at any place and time. A few students consider that all courses should be transformed into online courses

B. Level in a professional field and language level

Master students note they have sufficient background knowledge in a professional field and they consider that online courses give them opportunity to reinforce their professional background and to find new colleagues for further cooperation. Some fourth-year students hold that online courses gave them a chance to see some professional questions in a new light. However, eight fourth-year students had problems with understanding functional lexis in English. Unfortunately, seven out of ten third-year students had problems not only with functional lexis in English but with understanding some moments connected with their professional field. For that reason they needed the assistance of supervisors in Professional English and in professional field.

C. Difficulties during learning

Some students could not get through the course as it contained a large amount of material for learning. The majority of students who drop out the course note that they had no time to do the task (task had a deadline for completion). Six third-year and eight fourth-year students did not complete their courses as they felt isolation and were short of communication. Nine third-year students consider that they could have completed the course if they had been given a chance to discuss some questions and tasks presented in online courses with group-mates and university lectures of Professional English and lecturers of vocation-related subjects.

D. Online courses planned to be taken at our University

The results show that all students are interested in online courses as they can study without time, place restrictions. Most of third and forth-year students need in grammar and listening courses. Forth-year students (16) and master students (4) are interested in business correspondence and academic writing for future professional study. Seven third-year students would like to complete the online courses which help them to pass such exams as CAE, CPE and IELTC. Some third-year students (4) and fourth-year students (13) want to take online

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courses on professional topics which include a lot of tasks on listening, professional vocabulary.

CONCLUSION

Today Higher Education should be more flexible as we live in a highly dynamic world. Thus, to be competitive universities should present up-to-date learning courses such as online or blended ones. Findings show that master students are qualified enough to complete the course successfully, but a new learning model should be offered for third-year and fourth-year students. This model should consist of onsite and online classes. Key material should be given by lecturers and some difficulties should be discussed in groups. But additional printed materials, videos, sites and achievement tests should be placed on online education platforms as today's students prefer to study with the use of new technologies and innovations. As we see, all students prefer to take online courses and the need for schedule flexibility is a key element for choosing online learning as many undergraduates work and they do not have enough time to attend all onsite classes. But as findings show students have different preferences. Thus, universities should take students' preferences into account presenting online courses on their platforms.

The study results are considered to be useful for teachers who plan to present their own online courses or to enroll students for completing world open online courses. Besides, further study of existed online courses can help lecturers to find different online elements for creating their own online courses suitable for teaching or to discover open online courses which can be used in their teaching students with different knowledge levels and needs.

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Perspectives Of The University Technological Management From A Comparative Analysis Between The Management Of Traditional And Emerging Technologies

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Abstract

Technologies have specific characteristics depending on the stage they are in their life cycle; therefore their management should address such specificities. The aim of this study is to identify the challenges and perspectives that universities face to manage their technology-based academic results in order to have an impact on society. The research design included a conceptualization on the life cycle of technologies from theoretical references; and a comparative analysis based on reported cases, including management of mature and emerging technologies, from which main differences were established. The characteristics of university technology management, according to the life cycle stage in which the technology to manage is located (emerging, mature or declining), were identified. The analysis showed that in order to manage mature technologies, universities must build a close relationship between the technology provider and the end user. It is also important that universities form future professionals in methods associated with business management, benchmarking and continuous improvement processes, and implement this knowledge in the processes of their technology management. Furthermore, conducting prospective studies are proposed to ensure timely updates on topics that require future technological development. With regard to the management of emerging technologies, the study found that special characteristics are present: development of specific public policies in the framework of the National Innovation Systems, generation of national and international links to consolidate research, construction of multidisciplinary knowledge networks, training of human resources and strengthening of academic skills for negotiation and technology transfer, protection of intellectual property, and incubation processes in technology companies, among others.

Keywords: university technology management, traditional technology management, management of emerging technologies, life cycle of technology, particular characteristics, comparative analysis.

INTRODUCTION

Emerging technologies present some particular characteristics that differentiate their management in relation to mature technologies, and which should be taken into account when performing an innovation (Day & Schoemaker, 2001; Jaramillo, et al., 2005; Jiménez, et al.,

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2011; Loboguerrero, 2007). In organizations that have generated emerging technologies, special features in their management have been identified, which contribute to capitalize their results and develop a successful technological transfer from the university to the society (Balán, 2012; Bastos, Almeida, Diniz, & others, 2014; Etzkowitz, 2003; Leydesdorff et al., 1995). From the above mentioned, it is clear that the characteristics of the technologies vary according to the phase of the life cycle in which they are, and because of this, it is necessary that their management also vary. In this regard, it is important to identify current differences among processes of technological management depending on the phase in which a given technology is in its life cycle, since it will contribute to the comprehension of the aspects that should be considered when implementing technological management and the special characteristics of the technology that is going to be managed.

The objective of this study was identifying the characteristics of technological management, depending on the stage of the life cycle in which the technology to be managed was placed, with the purpose of evidencing the differences between traditional technological management (growing or mature management of technologies) and the management of emerging technologies. In order to accomplish this objective, a conceptualization was applied based on theoretical references of the stages that the technologies undergo in their lifespan. Besides that, a comparative analysis between the management of mature and emerging technologies was developed, based on the case studies reported from a literature review, in order to stablish the difference between these two types of management. The findings permitted to identify the challenges that universities face regarding technological management, which should respond to both traditional and emerging technologies.

1. The technology: life cycle and importance

There are different definitions encountered in the literature to explain "technology"; this is because it is a very wide concept that includes a set of "things" and at the same time "ways to do things". Because of this, an ambiguous definition can change depending on the context in which it is applied or studied. In this research proposal, technology has been defined as "the system of knowledge and information derived from either research and experimentation, or from experience, which united to the methods of production, commercialization and management that it undergoes, permits the creation of a reproducible form or generates new or improved products, processes or services" (Benavides, 1988 as cited in Gil & Zubillaga, 2006, p.3).

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As the fundamental base of the competitive advantage of the organizations in the last decades, technology is used in favor of the generation of add value in the organizations. However, the technology itself, as well as its demand, offer and management depends – in a direct way – on the state in which it is in the curve of its life cycle (Adner, 2004). It is not the same to manage a mature technology than a technology in decline or emerging, because the diverse factors that characterize them in every one of its stages (starting or emergency, mature and decline) are completely different and affect the market in different ways. That particularity in the management of technologies is related both to the curve of the market demand in which the technology is being introduced or used, and the dynamic of the innovation in the processes or products that strengthen or weaken the entry, acceptation and appropriation of technologies in the market (Adner, 2002, 2004; Gil & Zubillaga, 2006).

1.1 *Technology and its life cycle*

Depending on the state in which any given technology is in its life cycle, it presents some differentiating features. The literature reports four fundamental phases in a technology life cycle.

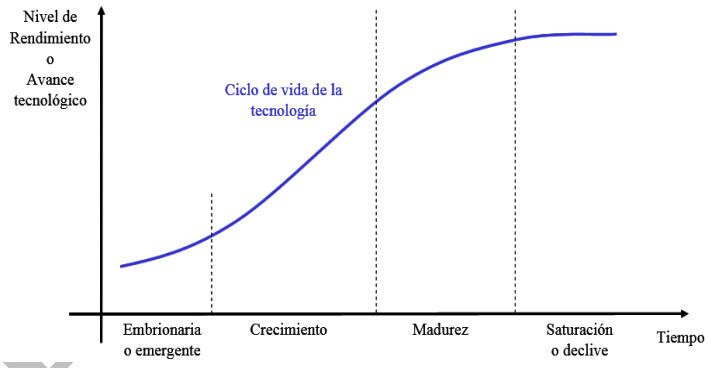


Figure 1. Identification of emerging technologies according to the phase in the life cycle of the technology curve (Adapted from Gil & Zubillaga, 2006, p.4)

1.1.1 Emerging Technologies (ET): Are Those Found In The Initial Stage Of Their Life Cycle With Specific Characteristics In Relation To Other Technologies (Growing, Mature Or In Decline.); To This Respect, As Their Name Indicate, Emerging Technologies Are In The Embryonic Or Emerging Stage In Their Life Cycle (See Figure 1.).

The Main Characteristics Of The Emerging Technologies Are Defined By Some Authors As: A) Emerging Technologies Are In The Initial Stage Of Their Development At The Beginning Of Their Introduction To The Market. B) They Could Be Pioneer Of Great Innovations. C) They Have Notable Potential Of Development. D) They Can Be The Creators Of New Industries, And They Have Neither Consolidated Nor Definite Markets. E) They

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Could Exert A Big Influence In The Market In A Short Term (Al Saeed, 2011; Atanu, Love, & Schwart, 1994; Day & Schoemaker, 2000; Halaweh, 2013; Myers, 2006).

According To Navas, Londoño, Ruiz & Ruiz (2012) The Literature States That Emerging Technologies Are Characterize Because They Have An Uncertain And Risky Acceptation. They Lack Historical Data For Their Study, They Are Unpredictable In Their Behavior, Their Applications Are Unknown And Not Proved, And Because All Of These Reasons, They Become ***Very Difficult To Manage.***

Another Important Characteristics Of Ets Is That They Can Or Cannot Be Considered Emerging In Different Contexts; Halaweh (2003) Indicated For Example How The IRF (Identification Through Radio Frequency) Is Not An Emerging Technology In Developed Countries, But They Are Still Considered An ET In Developing Countries Where The Infrastructure Of The ICT Are Still Scarce To Offer A Support To This Technology. Table 1 Summarizes The Main Characteristics Of The ET.

Table 1. Characteristics of emerging technologies (ET)

Characteristics	Description
Uncertainty of the emerging technologies	The uncertainty associated with the emerging technologies can take many forms such as entry values and unpredictable exits, immaturity of the standards and specifications, business models, price and uncertainty in the tax adoption. As time pass by, the emerging technologies mature and spread in such a way that the users increase at the same time that the costs diminish. However, the ethical and social considerations can increase while they are use in different ways.
Effect of Web of the emerging technologies	The value of emerging technologies increases as the number of users increases as well.
Costs of emerging technologies	The cost of an emerging technology as well as the replacement of a traditional technology with an emerging technology is high.
Unknown impact of emerging technologies	The ethical and social aspects associated with the use of an emerging technology are not obvious, unknown and in many occasions, they are inspect before being adopted or during an early phase of use.
Limitations of the availability of the emerging technologies to the inventor or creator country	It is usually available for its use in a particular context or in the country where it was created or invented.
The emerging technologies are not totally investigated	Most of the information related to emerging technologies is technical reports produced by the manufacturer of the ET with little academic/scientific investigation.

Source adapted form: (Halaweh, 2013, p. 5)

The importance of emerging technologies in its capability to provide a disruptive change to the society and generate impacts by means of innovations that originate from them has been identified for years. Some examples of emerging technologies that transformed the way life was conceived are nanotechnology, information and communication technologies (ICT), biotechnology, genic therapy, electronics, super conductors, intelligent sensors, digital images, micro machinery, interactivity, e-commerce, and superconductivity, among others (Al Saeed, 2011; Day & Schoemaker, 2000). Manyika et al. (2013) state that, in this historical moment, the introduction of technologies is experimenting great progress, which generates developments that transform business, worldwide economy, and even life. These is due to the fact that the ETs are disruptive and generate big changes that are necessary, valuable and important to be studied, examined, and adapted in an adequate manner in order to capitalize the yield that they can generate. In same way, during the last 14 years, the Technology

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Review magazine from the Technological Institute of Massachusetts (MIT) has been in charge of annually identifying 10 emerging technologies.

Based on the studies developed by the McKinsey's group, some emerging technologies that will be disruptive in the period of 2013-2025 are the mobile internet, the knowledge automation work, the technology "cloud", the robotic advances, autonomous vehicles, the efficient energy storage, 3D printing, advanced exploration and exploitation of petrol and gas and the renewable energy (Manyika, et al., 2013). As a conclusion emerging technologies are important because they generate impact since they are a transformative factor of the global economy, businesses and **of life, indeed** (Al Saeed, 2011; Day & Schoemaker, 2000; Day, Schoemaker, & Gunther, 2004; Halaweh, 2013; Hung, Wang, & Chang, 2012; Jiménez, Castellanos & Villa, 2011; Manyika et al., 2013; Myers, 2006; Navas, Londono, Ruiz, & Ruiz, 2012; Tsang, Bates, Madison, & Linkov, 2014; Technology Review and Group Mckinsey).

1.1.2 Growing and mature technologies

Growing technologies are those that are gradually entering and being accepted in the market. Consequently, technologies become mature when they are totally used and accepted by the market especially in the same productive processes. These technologies are particularly characterized by having consolidated markets and using standardized, mechanized and automatized processes, (Centro de Artigos, 2012; Ochoa Ávila, Valdés Soa, & Quevedo Aballe, 2007; Pérez, 2001). One of the fundamental characteristics of growing technologies is that they are in the process of becoming more useful step by step, while mature technologies have already reached an adequate efficiency level in order to be widely used in the market. Besides that, a technology is mature when users use it with easiness and when there is a reduction in the rate of new advances and only incremental improvements are introduced.

According to Centro de Artigos (2012) some mature technologies are a) motor vehicles, which are widely used by experts and whose general principles have not changed in decades; b) guns, characterized by the rifle technology of assault, most of whose advances are minor improvements that makers modify (equilibrium between weight, fire potency, range and precision); and c) agriculture, with stablished, standardized and consolidated processes. According to the same authors, some growing technologies are internet, with existing conflicting technological standards; computers and their uses; economic models, among others.

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1.1.3 Technologies in decline

Technologies in decline are defined as the technologies for which it is neither possible to do any improvement in their performance nor to obtain any additional benefit in their use. After a period (of saturation), they become totally obsolete; besides, the comparative performance of these technologies with a competitive technology determine technologies in decline as losers (Aguilar et al., 2012; Centro de Artigos, 2012; Pérez, 2001; Sandborn, 2007; Universidad de Vigo, s. f.). According to Onandia, (2011) some of the technologies in decline are back-up copy, photographic roll, paid e-mail address, dial-up, video-club, telephone and long-distance call, DVD reproducers and FAX.

2. The technological management in universities

Technological management (TM) is a structured and systematized process whose objective is to adopt and execute the policies, strategies, plans and actions related to the creation, diffusion and use of the technology. Furthermore, it is a multidisciplinary process and its task is to be the interface between technologies and the other areas of knowledge (Gaynor, 1999; Ochoa, Valdés & Quevedo, 2007). As an administrative process, technological management is directed with the purpose of performing an adequate planning of the technological resources in order to facilitate and accomplish the intended objectives of the organization. The final purpose of this activity is "the deliberated and systematic incorporation of the technological change for the development of the countries, companies or organizations" (Tapias, 2000, p.14). Technological management is fed by activities that go from the technological vigilance itself, goes through the protection and transference of technologies, and finally impact the system of the Competitive Intelligence (CI) of the organizations (Escorsa, Maspons, & Llibre, 2001).

The processes of technological management are related with the creation of the competitive advantages of the organizations, from the contribution of the same in terms of generation of the innovations that will be transferred to the market. In order to do this generation of innovations, it is fundamental to create university and industry links that foster the process (Gaynor, 1999). In this sense, Ochoa, Valdés & Quevedo (2007) consider that the process of the TM is born from the organizations that have, as a purpose, to improve the links between the university, the industry and the society. According to the authors, through TM, technological changes of the organization are integrated and conferred a strategic and a long-term importance.

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Technological management in universities (TMU) originates due to the fact that it is strengthened through the establishment of relations between universities, industry and society; in addition, institutions of higher education (IES) are called to meet the "third mission" (related to their direct role in economic development and their real impact on society).

In this sense, the existence of a model of an enterprising and investigative university, in the society of knowledge, brings about new challenges to these institutions. These challenges are, on the one hand, the development of the society as the product of social and economic progress, which is obtained through the effective application of knowledge. And on the other hand, the demonstration and affirmation that higher education is fundamental in order to give support to the process of creation, divulgation and appropriation of knowledge. Countries that ignore these challenges are in risk of falling behind in this new worldwide order (Pineda, 2013; Jimenez & Castellanos, 2008).

Likewise, Donini & Donini (2003) explain that the existence of new approaches regarding the generation of knowledge, along with the dynamics evolving inside universities, implies that they should develop their research activity within a dynamic and connected way with the society and the productive surrounding. Castrejón, Hernandez & Ruiz (2014) state that the technological management developed in university research groups is a trigger element for competitiveness; due to this, the diverse aspects that enclose the TMU should be taken into account in the innovation systems, and supported in an integral way, in order to strengthen and improve its results.

TMU consists on identifying, controlling, evaluating, enriching, optimizing, and protecting technologies in the organizations (Gaynor, 1999; Jiménez, Castellanos, & Morales, 2012; Tapias, 2000). According to the tools used in TMU, it is important to emphasize scientific and technological protection of the intellectual property because this is the tool to guarantee that authors can exploit scientific and technological production. However, Valencia (2013) states that in developing countries the process of research, development and innovation (R+D+i) does not receive the necessary attention; because of this, it is recommended that research centers or groups be in charge of increasing the productivity of the countries. Normally, these centers of investigation are inside the Institutions of Higher Education (IHE) or inside universities; thus, it is necessary to develop an adequate process of technological management that transversally supports the process of I+D+i in these spaces/places. As a result,

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organizational structures in the IHE that guide the process of technological management in the university with the purpose of facing the mentioned challenges have been created (Jimenez & Castellanos, 2008).

2.1 The management of emerging technologies (MET) and its relation to the university

Emerging technologies present a series of particular characteristics, such as their high level of risk and uncertainty, their lack of historical data to do models of behavior, their incipient or lack of introduction into the market, and their disruptive potential as creators of new markets. Because of this, they should be managed differently from mature technologies (Day & Schoemaker, 2001; Jaramillo, et al., 2005; Loboguerrero, 2007; Jimenez H., el al., 2011). According to Bhattacherjee (1998), the management of these technologies in the organization requires some particularities due to the fact that they are unknown, non-proven and risky used; however, organizations have the challenge of identifying, developing and motivating them.

Due to emerging technologies are normally born in university research groups, particularities in their management have been identified in the universities that have managed them. The fact of contemplating these particularities in the management process, has contributed to the capitalization of research results and facilitated successful technological transference from the university to the society (Alshumaimri, Aldridge, & Audretsch, 2010; Tegarden, Lamb, Hatfield, & Ji, 2012).

In the university context of developed countries, the existence of institutional conditions that favor the MET in order to generate impact in the productive sector has been evidenced. In order to achieve high capacity for research, and obtain important results, it is necessary to contemplate the availability of financial and physical resources, human talent, wide and varied relationships of cooperation, a dynamic interaction with the managerial and industrial environment, and the existence of governmental policies of support to the activities of science and technology (Balán, 2012; Bastos, Almeida, et al., 2014; Leydesdorff, et al. 1995; Tegarden et al., 2012).

Some of the specific aspects identified in the universities that manage emerging technologies are, the existence of offices exclusively dedicated to technological transfer; tools of TMU in order to provide a direct support to the researchers, regarding intellectual property

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and negotiation. Besides that, an adequate management of economic risk, the creation of specific programs in relation to emerging technologies, and the concrete evidence that universities recognize the particularities of emerging technologies and as a result they give them a differential treatment is fundamental (Jimenez, et al., 2011).

3. Comparative analysis between mature technologies and emerging technologies.

After a literature review in scientific databases with an equation of searching that permits access to studies about technological management in universities, new specific cases of TG and MET reported by the literature were identified. After this, a comparative analysis of the cases was made, identifying the characteristics of technological management both for mature and emerging technologies.

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Tabla No. 3. Comparative analysis between mature technologies and emerging technologies

Study	Type of technology	Characteristics of the technological management	Observations	Authors
1) The innovation and transformation of the technologies in the experimental station "Indio Hatuer."50 years bringing development of the Cuban rural sector. (Part I)	Agriculture (in this case of emerging technology)	Association with the Ministry of Agriculture One multidisciplinary group advisory for the introduction in the field. Visualization of the technological transference as a component of the territorial rural development.	Conservation of the forage as a strategy to alleviate the nutritional deficit in draught. It can be a mature technology in other countries. In this context, it could be consider emerging.	(Miranda et al., 2011)
2) Transference of technology and technological knowledge. Reflections base on empirical Works.	Construction of presses for an assembly plant (mature technology)	An important relationship between the supplier and the client, with supplier is training as well as the access to the instalments for developing the demonstrations and improvements "in situ" by the engineers of the supplier company.	Mexican companies that produce electric-frier to the American market. In order to have a technological transformation, social relations should be supported.	(Arvanitis& Villavicencio, 1994)
3) Web of knowledge management in the area of liquid bio-combustion BIOweb	Bio-combustion (emerging technology)	Proposal to construct of a "web" of knowledge in the topic of bioethanol hence the knowledge does not scatter and links strength between producers and investigators.	Nonaka and Takeuchi base the model in the proposal about the knowledge circulation.	(Godoy-Bonilla et al., 2013)
4) Proposal of support for an efficient management of biotechnology	Biotechnology (emerging technology)	Tending to the creating of links between investigators, the productive sector and creation of national and international alliance. One of the limitations that the study evidences specifically refers to "management" as a process of negotiation, transference, protection of the intellectual property and the creation of adequate links among the actors in the process.	It suggests the promotion of links in different areas of the knowledge such as: environmental, management, social going beyond the basic sciences, for the adequate management of the biotechnology.	(Hernández, 2013)
5) Generation, diffusion and adoption of technologies for the production, benefit and conservation of the seed of foraging plants with a corporate approach.	Conservation of seed of foraging plants for the improvement of the grass in the Cuban stockbreeding and the tropical countries (mature technologies)	The development of technologies it was accompanied with training actions postgraduate studies and publications. With the purpose of potentiate the process of diffusion and the adoption, it was introduced a centered approach in the client, and a set of methods and procedures associated to the corporate management for example benchmarking and continues improvement. It was introduced key aspects such as the conception of innovation in farms, the permanent interaction of the investigator-producer, training, organic production and productive diversifications.	The development of the existing farms was reinforced and the creation of 15 new farms.	(Pérez et al., 2007)
6) Incubation of projects to corporate initiative in the Universidad Libre de Cali.	Different, mature and emerging technologies.	It was developed a systematic process for the incubation of projects of technological base that fulfill the following requirements. a) Record of a management plan formulated and evaluated in the incubator; b) evaluation for the consultants and advisors of the Nodo; c) assignation of an consultant-advisor for every project: d) implementation of a diagnostic technic, follow-up and record of the information of the projects, its business plans, as well as the its process of incubation and formalization. e) Implementation of consultant and advisory techniques for the accompaniment in the assembly of the productive units, follow-up and strengthening. f) Adaption of the corporate incubator, providing it with physical, intellectual and rational capital.	The scientific novelty of the developed experience focus in the articulation of the engineering, the learning and the entrepreneurship for the formulation of communitarian projects, that finishes the process on incubation of the creation of business in a program of Spin-off starting in the university.	(Villanueva & Triana, 2010)
7) the management of the intellectual property of Mexican investigations: the case of Mexican Institute of petroleum	Emerging technologies in the petroleum field.	Because the pressure for obtaining return of the investments in the centers of investigation, it has be generated mechanisms of transfer of technologies in order to generate a source owned incomes, which clearly shows the weaknesses of the intellectual management (IM), as a fundamental part of the process of the technological management. The IM in order to add a value to the activities of the technological management, it should incorporate	The protection of the results of the investigation is considered and strategic aspect by permitting the return of the investment in I+D. technological intelligence, licensing, value and technological transference are new elements of this concept.	(López & Rebolledo, 2007)

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		topic such as the vigilance of technological patrimony, policies of license or transference competitive technological intelligence, selection and design of projects, as well as the mechanism of promotion to the invention. This would help to convert the rights of intellectual property in intellectual actives.	InMexico, it has been done important investments in order to strength the infrastructure and capacities; however, the return of the investment is very little due to the little experience in the management of the intellectual property.	
8) Construction of webs of transference science – industry in the biotechnological sector in Mexico. Case studies about the technological link between investigators of CINVESTAV Irapuatory LANGEBIO and companies of the agro-bio-technological sector	Biotechnology	The investigation starts from the assumption that certain political, technological, relational, institutional, organizational and cultural conditions ogía (emerging technology in the national level shapes some types of forms of correlation for the transfer between science and industry. Based on the information above, the biotechnological sector in Mexico it fulfills: a) the formation of scientific groups oriented to multidisciplinary and inter-institutional investigations, b) the development of national and international webs of investigation. c) for the appearing of organizations and mechanisms of intermediation that energize the links among actors; and d) the appearance of new organizational forms of connection among them; e)it has appeared programs that have supported the creation of a committee of investigation, scientific parks and public and private associations.	Base on the case of the developed interactions around the groups of investigation of a federal center of investigation a (CINVESTAV Irapuato) and the companies of agro biotechnology, it has been analized the modalities of interaction from informal canal of transfer, formal and commercialization. Likewise, the case evidences the relevance of the intermediation from organizational mechanisms public programs in the configuration of new types of relation among actors, and the relational character of the technological and knowledge transfer. .	(Stezano, 2012)
9) Contribution of industrial relationship sugar-university to the creation of scientific and technological capacities.	Mature technology (sugar processes)	In the paper is explained how by means the systematic relation of the Center of Analysis of Processes of the Universidad Central de "Marta Abreu" de Las Villas keep with the industry of cane of sugar have obtained a strategy of an investigative scientific. This links based on a pilot study of the productive installation of that economic sector of the country. Include the ways and strategies of work to obtain an increase in the preparation of the scientific tables and guarantee the substitute generational in the topic that the future development demand. Also strengthening the lines of scientific investigation, doctoral and master thesis that are executed in the scientific field of the center of investigation. And at last, consolidation of the capacities of service and technical assistance to clients in the center of investigation and development, as well as the generation on knowledge through the actions in productive organization, e) formation of human resources.	It has been shown how it has accomplished by means of the collaboration with the corporative advisor the objective of creating knowledge from an adequate and determination of technological demands of productive companies of the industry of chemical processes and fermentations, in such a way that it guarantees through its introduction a fast impact of the results of the investigation.	(Garriga, Zamora, Kafarov, & Toledo, 2012)

Source: own elaboration based on the authors cited in the table.

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4. Conclusions, challenges and perspectives

With the purpose of having a clear outlook of the challenges and perspectives that technological management has within the university context, depending on the phases in which the technology to be managed is, particular characteristics additional to the traditional management of mature technologies, which should be taken into account in the management of emerging technologies, have been identified. In the case of management of mature technologies, some particular characteristics in the studies revised prove that the following aspects should be consolidated:

1. The existence of a close relation between the supplier of the technology and the user, with training offered by the supplier as well as access to the user, in order to test and improve installations "in situ", which will also have influence in the strengthening and adoption of the technology.
2. The use of methods and procedures associated to the corporate management such as benchmarking and continuous improvement is evident.
3. The use of pilot studies by different economic sectors of the country with the purpose of planning strategies in order to guarantee generational change in the topics that future development might need was observed.
4. In the analyzed cases, studies carried out with the purpose of guaranteeing the consolidation of the capacities of services and technical assistance to the client in research-and-development centers (R+D), along with the generation of knowledge through actions in productive organizations, which will help with the formation of human resources was evident.

In the case of management of emerging technologies, it is necessary to implement additional processes to the ones developed in the management of mature technologies, which should be transversal to the TMU and involve:

1) The development of public policies in terms of Systems of Science, Technology and Innovation that tends to and help with the generation and strengthening of national and international relations in the strategic sectors of the country.
2) The generation of close relations between the centers of investigation and the companies users of technology, regarding training processes, transfer and even traceability of the functioning of the generated or adequate technology.
3) The construction of webs of knowledge in order to strengthen the process of

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investigation, diminish its economic risks, and generate collaborative and multidisciplinary research that would contribute to the innovation, is paramount.

4) It is advisable to strengthen the process of "management" as a process of negotiation, transference, intellectual protection, and creation of adequate relations among the actors of the process.

5) The existence of processes of systematic incubation of companies of technological base that fulfill standardized steps, which leads to a successful transfer and the creation of a spin-off.

6) Regarding the management of intellectual property, it should be complemented with processes of vigilance of technological patrimony, policies of licensing or technological transference, competitive technological intelligence, selection and design of projects, and mechanisms of promotion of inventiveness. This will help to turn intellectual property rights into intellectual actives.

7) Regarding the biotechnological sector (which is supposed to be applied to the other emerging technologies), it is recommended to establish scientific groups oriented to the multidisciplinary and inter-institutional investigations, to support the appearance of organizations and mechanisms that energize the relations among the actors, and to foster the emergence of new forms of relations among them.

The main challenges for technological management within the university (TMU) regarding the management of emerging technologies are evident in the necessity to increase investment in projects of investigation; one way to achieve it is the consolidation of the management of intellectual property. By the same token, it is paramount to create effective social, commercial, and industrial relations that may support technological transference, as well as the articulation of efforts from the IHE, to create entrepreneurships that produce, as a result, the creation of spin-off. In this sense, it is relevant to foster the mediation, from organizations and the public sector, of new types of relations between the IHE and organizations, with the purpose of guaranteeing a real impact of the results of investigations and a quick introduction of developments in the market.

Finally, some perspectives to university technological management are derived from the study:

1. It is necessary to recognize that the IHE should advance in the development of

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effective processes to accomplish with the third mission (direct role in the economic development and the real impact in the society) due to the fact that these are the academic spaces that present the capacity and resources regarding the process of I+D+i.

2. For the IHE to accomplish with their third mission, they should be effective in the generation, appropriation, use, diffusion, transference and consolidation of technologies, not only mature but also emerging, in the market. These technologies will serve as the base for the technological advances and the innovation that nations require, to increase their economic growth, development, healthiness and social wellbeing.

3. Regardless the perspectives mentioned above, it is not possible to create scenarios without a solid and total support from the public policies that strengthen the National Systems of Innovation, so that the IHE are back-up in these processes of the TMU.

4. The IHE should work for the management of emerging technologies, because they are the base of future changes in the dynamic of the market and because, in most of the cases, they are generated from the university research groups. It is there where the capacities and resources for technological management should be strengthened, so that innovation dynamics may get faster, efficient and really affect society.

5. Based on the previous information, the technological management in the university should be supported with processes that foster and support emerging technologies. In this sense, it is pertinent to implement processes as the ones observed in the projects presented in this study: a) strengthening links between the universities and the user companies of technology; b) constructing webs of knowledge with which the process of investigation are empowered; c) strengthening the process of "management", as a process of negotiation, transference, protection of intellectual property and creation of adequate relations among the actors; d) promoting efficient management of intellectual property, which brings about intellectual actives; e) supporting research groups with processes of vigilance of the technological patrimony, policies of licensing or technological transfer, competitive intelligence processes, design and selection of projects, etc.; and finally f) developing a strong and deep conviction of the importance of the research process, from the strategic management body of the university as part of their substantial duties.

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Post-Modernitenin Medya Tüketimine Yaklaşımı: Yeni Medya Ve Üretilen Yeni Sosyal Anlamlar İlişkisi

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Özet
Postmodernizmin toplumsal ve kültürel yansımalarının açıklaması olarak postmodernite, yeni medya ile yaşanan küresel tüketim anlayışları ve üretilen yeni sosyal anlamlar için kültürel bir nitelik oluşturmuştur. Yeni medyanın tüketim anlayışlarıyla temalandırılabilen ve sosyolojik bir tanımlama olan 'simülasyon çağı' Baudrillard'ın (1991), postmodern yaklaşımının genel muhtevasını yansıtır. Yeni medyanın bir simülasyon (benzetim) aracı olarak konumu, günümüz bireyinin eylemleri açısından postmoderniteye bağlı anlamsal doğrultudaki bir kültürün ve sosyal yapının sonuçları ile aynı doğrultudadır. Bu yaklaşıma göre, her bir medya tüketicisinin deneyimleri, 'imajların pasif emilmesi' bağlamında ele alınırken, tüketicinin anlam üretimi ise ikinci plandadır. Ancak yeni medya, kitle kültürü üzerinden postmodern tüketimi yapılandırırken, aynı zamanda sosyal anlamların üretimine ve dolaşımına da referans olmaktadır. Bu yolla üretilen anlamın küresel etkileşimlerle ortaya çıkan çağdaş tanımlamaları ise onu sosyolojik bir bildirişim aracına dönüştürmüştür. Bu çalışmada yeni medya ile oluşturduğu çevrede bireyin, sosyal ağların küresel etkilerine bağlı olarak üretilen 'sosyal anlamlar'la olan ilişkisi tartışılmıştır. Konuyla ilgili literatür taraması yapılmış, yeni medyanın elektronik ortamdaki kullanım pratikleri sonucundaki sosyal anlamların üretimine yönelik katkısı, postmodern kültür açısından incelenmiştir.

Anahtar Kelimeler: Postmodernite, yeni medya, sosyal ağ, sosyal anlam üretimi

Approach Of Post-Moderısm To Medıa Consumptıon: The Relatıon Wıth New Medıa And New Socıal Meanıngs That Are Formed

Abstract
Postmodernism as an explanation of cultural and social reflections of post modernism formed a cultural property for new social meanings that are produced and global consumption perceptions that carried out with new media. "Age of Simulation", a sociological definition that can be formed with consumption perceptions of new media, reflects the general content of Baudrillar's postmodern approach (1991). Simulation of new media as a simulation organ is on the same direction with the results of cultural and social constitution on a way of meaning that is depended on postmodernism in terms of modern individual's activities. According to consumers' sense/meaning, production is the second, while each media consumer's experiments are discussed in the context of "passive absorption of images". However new media structures the postmodern consumption on a mass media culture, it is also a reference for the circulation and production of social meanings, too. Modern definitions that arise with the global interactions which produce in such way became a sociological notification organ. In this study, the individual's relation in the profile that is formed with new media is discussed depending on the global effects of social medias. The contribution of social meanings that are production oriented is surveyed in terms of postmodern culture and also the literary search about the subject was made.

Key Words: Postmodernism, new media, social media, social meaning production

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1. Giriş

İnsanın kültürel dünyasının şekillenmesinde 20. yüzyılın son çeyreğinde meydana gelen sosyal, kültürel ve endüstriyel gelişmelerin önemi oldukça büyüktür. Çoğu kez tekrarlandığı gibi bu gelişmeler doğrultusunda iletişim biçimlerinin aldığı son görünüm sosyolojik açıdan önemli bir değerlendirme konusudur. Günlük yaşam deneyimleri veya pratiklerinin her türden etkisini arttıran günümüz medya teknolojileri, özellikle kimlik oluşumlarını etkileyen unsurlar olarak, bireyin kendi anlam çerçevesini oluşturmasına ve genel sosyal anlamları ile olan diyaloğunda başat rol oynamaktadır. İnternet aracılığında teknolojinin olanakları ile mümkün olabilen ve dolaşıma sokulan yeni medya, bireyi kendisi ve çevresi ile sürekli diyaloğun içinde tutabilen, etkileşimli hale getiren, bireysel olarak anlamlı kılan ve bunun ötesinde kültürel olarak üretilen sosyal anlamların bir parçası durumuna getirmiştir. Etkileşimler ve paylaşımlar sonucundaki diyaloğun ortaya koyduğu gerçeklikler olarak yeni medya ile oluşturulan -facebook, twitter, instegram vb. gibi- sosyal anlamlar, kitle kültürü açısından günümüz toplumlarını ifade eden bir tema ve yaklaşımdır. İnsani değerlere, doğaya ve genel çevreye dair üretilen anlamların oluşumu ve değer olarak paylaşılması da yine yeni medya ile kitlesel olarak gerçekleştirilen bir yapı ortaya koymaktadır.

Sosyal paylaşımın ve kültürel etkileşimin sonucu olarak anlamı, yeni medyanın oluşturduğu eksende postmodernitenin bakışı olarak incelemek konumuz açısından önemlidir. Anlam, toplumda var olan düşüncenin önemli bir yansımasıdır ve insan zihinsel olarak anlam yaratmak için programlanmıştır. Bireyin anlam üretimi sürecinde yeni medya, bir tür krize neden olmuştur. Yeni medya üretimlerinin oluşturduğu kurgular dünyasında kültürel ve sosyal varlığını sürdürebilmek amacındaki birey, medya üretimleri ve bunların etkilediği olaylar ve olgular arasında bir tür bağlantı kurmak, sebepler aramak-üretmek ve de çözümlemelerde bulunabilmek için bir takım anlamlar oluşturmak zorundadır. Günümüz yeni medya endüstrisi ve bununla gelişen kültür, bireyin anlam yaratımının toplumsal karakterini belirleyen unsurların büyük ölçüde yerini almış durumdadır. Nesnel bir gerçeklik olarak var olan toplum, ondan doğrudan etkilenen bireylerin etkileşimi ve anlam bütünlüğüne dayanmaktadır. Sosyal anlam yaratımı ise buradaki etkileşimle ve iletişimle ortaya çıkan bir olgudur. Dolayısıyla yeni medya, sosyal anlam yaratımının somutlaştırılması, şekillenmesi, yenilenir ve geliştirilebilir olması bakımından güçlü bir sistemler bütünlüğü oluşturmaktadır. Tüketimin her alanı içinde medya yoluyla oluşan kurgusal dizgelerin anlamsal karışıklığı, sosyal alanda hızla daha geniş alanlara taşınmaktadır. Teknolojik faktör, kurgu ve sanatsal

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bağlamların komplike uygulamalarının yansıma alanı olarak yeni medya endüstrisi dijital medya, görsel medya, işitsel medya, sosyal medya, basılı medya, multimedya, çoklu medya gibi tanımlamalarla zihinleri karıştırmaktadır. İletişimi ve bunun ötesinde bir eylem biçimi önermesi bakımından yeni medya, sosyal ve kültürel alanda bireyin sosyal anlam yaratımı için başvurduğu çağdaş bir kaynak durumundadır. Öte yandan yeni medya ile oluşturulan sosyal anlamların rasyonelliğini çözümlemek doğrudan kurgu, sanat ve medya ilişkilerini ve bağlantılarına yönelik bakışın geliştirilmesi ile mümkün olabilir. Üst-gerçekliğin pazarlayıcısı konumundaki yeni medya ile günümüz bireyi, bir hayali, silüeti, nesneyi tüketir durumdadır. Gerçekliğin medyanın oluşturduğu simülasyon platformundaki görümü olarak üst-gerçeklik, günümüz bireyinin kendisini konumlandırdığı sürekli yenilenen ve başkalaşan bir ortam oluşturmaktadır. Yaşamın her alanını işleme/ele alma eğilimindeki yeni medyanın oluşturduğu bu platform zamanın kültürü açısından postmodernist bir karakteri sergilemektedir. Sayısız kere ve farklı biçimlerde üretimi mümkün olan yeni medya ile oluşturulan tüketim toplumunda her şey hayale, görüntüye, gösteriye ve estetiğe dönüşmüş durumdadır. Eşyanın yerine tasviri, aslının yerine kopyası, gerçeğinin yerini temsili almıştır. "Medya çeşitli görüntüler, resimler ve temsillerle insanlar için bir tür 'çift yönlü iletişim' yaratmıştır" (Mitchell, 2005: 7). Yeni medyanın üst-gerçeklik bağlamında çift yönlü iletişimin oluşturduğu genel kitlesel kanı ve tüketim anlayışı, karşılıklı değerlerin sonucunda ortaya konulan ve paylaşılan ortak dilin sonucundaki anlamlar bütünüyle postmodernitenin bir ifadesi olmuştur.

Yeni medya, tüketim referansları özelliğinin ötesinde sosyolojik fonksiyonu açısından oldukça geniş bir ilişkiler ve etkileşimler ağı ortaya koymaktadır. Onun bu özelliği Baudrillard açısından postmoderitenin önemli bir gereksinimi ve günümüz iletişim kültürü, tüketim kültürü açısından sosyolojik bir görünümdür. Günümüz kitlelerini imajlar, şekiller ve kodlarla hareket eden topluluklar şeklinde ifade eden ve bu bağlamda medyanın bu unsurlarla simülasyon oluşturarak bir takım üst-gerçeklik alanı medyana getirdiğini açıklayan Baudrillard, medya tüketicisinin tercihlerini aktif süreçten geçirme veya anlam üretmeden ziyade, imajların pasif emilmesi bağlamında değerlendirir. Baudrillard bu şekilde, simülasyonlar ve asıl-ötesi analizini yaparak sosyal kuram ve medya eleştirilerine, üretim ilişkileri gerçeğini bir yana bırakan bir postmodernist olarak eşlik etmektedir (Baudrillard, 1987). Yeni medya tüketimi üzerinden gerçekleştirilen imaj ve imge tüketimi, tüketilen nesne ve tüketici arasındaki psiko-sosyal ilişkinin ifade biçimidir.

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2. Yeni Medya Kuramı ve Estetik Bağlam

Medya insanlık tarihi için kültürel bir devrim yaratmıştır. "Uygarlık tarihi içinde medyanın özel bir yeri vardır" (Zielinski, 2006: 3). Medyanın kültürel bir form olarak ortaya çıkması ve güçlenmesi öncelikle iletişim teknolojileri ve estetik bağlamlarla ilişkili bir durumdur. Tüketiciyi gerçekliğin öncesinde imaj olarak etkileme eğilimindeki medya bu şekilde tüketici ile arasında estetik bir bağ kurar. Bundan sonraki süreçte tüketici sahip olduğu medya ile kendisini bütünleştirmeye çalışır. Günümüze gelindiğinde medya tercihleri veya kullanımı büyük ölçüde, bireylerin kültürel yaşamlarını yansıtan onlar için yaşamsal bir zorunluluk durumuna gelmiş önemli bir planlama ihtiyacından kaynaklandığı görülür. 20. yüzyılın son çeyreğinden itibaren bilgi ve iletişim bağlamlı endüstriyel gelişmelere bağlı olarak gelişen ve günümüze kadar multi-medya şeklinde de anılan yeni medya kavramı sosyolojik bir güç yaratmıştır. "Yirminci yüzyılın son on yılında yeni dijital medyanın gelişimi çok hızlı olmuş ve geleneksel medyayı alışılmadık bir konumda bırakmıştır. Eski geleneksel elektronik ve basılı medyanın bu duruma karşı yapabileceği hiç bir şey yoktur. Bu gayet doğal bir gelişmedir. Günümüzde hem eski hem de yeni medyanın kendilerini yeniden yaratma olgusu ile karşı karşıyayız" (Bolter ve Grusin, 1999: 5). Uydu bağlantıları, internet bağlantıları ve multi-medya bağlantıları ile oluşan yeni medya tanımına girebilecek oldukça fazla seçenek bulunmaktadır. Estetik bağlamlar sonucunda kurgulanan ve tasarımlanan medya seçeneklerinin her birinin bu doğrultuda belirli disiplinlere bağlı olarak üretildikleri bilinmektedir. "Ama medyadaki asıl yenilik 21. yüzyıldaki ikinci dalga ile gerçekleşmiştir. Yeni bloglar, sosyal medya, metin mesajlaşma ve diğer dijital araçları kapsayan kompleks sistemlerle sürekli kendini yenileyen ve gelişen bir yeni medya sistemi ortaya çıktı" (Vogt, 2011: 17). Vogt, dijital devrimin ayak seslerinin 1943'lü yıllarda başladığını ifade ederek, 1943 yılında, IBM başkanının kısa sürede bilgisayarların dünyada büyük pazar oluşturacağından söz ettiğini hatırlatır. Birkaç yıl sonra, bir başka teknoloji şirketinin başkanının iddiasına göre ise, herkesin kendi evinde bir bilgisayar isteyeceğini ve bunu gerçekleştireceğini söylediğini belirtir (Vogt, 2011: 16). Elektronik sistem üzerinde oldukça geniş kompleks bir yapısal bütünlüğü yansıtan yeni medya, bu yapısıyla tüketicinin günlük deneyimlerine ilişkin arzu ettiği genel eğilimleri sağlamanın hedefindedir. Böylece yeni medya sosyalitenin, kültürün, yaşam biçimlerinin dijitalleşmesini gerçekleştirmiştir. Böylece, "yeni medya selefine göre ayırt edici birçok tipik özelliğe sahiptir. Yeni medya genellikle Web üzerinden geniş bir birleştiricisi bir sistem gerçekleştirerek, herhangi bir dijital cihaz üzerinden her zaman ve her yerde içerik üretebilen ve erişime imkân tanıyan bir sistemdir"

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(Vogt, 2011: 17). Bu durum yeni medya ile oluşturulan ve dolaşıma sokulabilecek yeni kültürel formlar ve yeni sosyal anlamlar için önemli bir zemin oluşturmaktadır. "Yeni medyanın en belirgin ve güçlü özelliği etkileşimli olmasıdır. Geleneksel medya tek yönlü bir akışa sahipken, yeni medya geniş bir yelpazede görüşme ve etkileşime olanak tanımaktadır. Geçmiş teknolojilerin aksine, yeni medya interaktif bir iletişim ortamı sunmaktadır" (Vogt, 2011: 17). Bu bakımdan "günümüzdeki medyanın belirli formları vardır: dijital fotoğraf, animasyon, video ve grafik tasarımlar gibi çeşitli özellikleri içerir" (Bolter ve Grusin, 1999: 6). Buna göre yeni medya kategorisindeki bir cihaz üzerinde video, telekominikasyon sistemi (transfer ve iletişim gibi), dijital fotoğraf özelliği ve tasarım programlarını içeren bilgisayar gibi bileşenlerden oluşmaktadır. Bu nedenle, "birçok yeni medya projeleri, klasik stüdyo sisteminin aksine büyük ekipler tarafından oluşturulur. Böylece, popüler oyunlar ve yazılım uygulamaları gibi birçok yeni medya nesnelerinin milyonlarca kopyası üretilir. Ancak büyük sanayi ile birleşen yeni medya alanının bir başka özelliği, çeşitli donanım ve yazılım standartlarına sıkı sıkıya bağlı kalmasıdır" Manovich, 2001: 15). Dolayısıyla yeni medya genel iletişim özelliklerini ve çoklu ortamları bütünüyle kapsayabilen ve tek bir parçada bütünleştirebilen bir yapı ile karşımıza çıkmaktadır.

Yeni medya öncelikle teknolojik sistemler bütünlüğü olarak yaratılmaktadır. Yaratım süreci ise bütünüyle estetik bir tasarımın genel koordinatlarına bağlı olarak gerçekleştirilir. Yeni medyayı tüketim tercihlerinde ve günlük yaşamda bu kadar önemli kılabilem ve onu kültürel ve ekonomik potansiyelde etkili duruma getiren bir diğer özellik, estetik bağlamlar sonucunda üretilen bir nesne olmasından kaynaklanmaktadır. Bir tasarım nesnesi olarak belirli kriterlere sahip olabilen yeni medya, tüketiciye belirli bir estetik sunumu, ortamı, bu yönüyle kültürel bir gruba dahil olabilmeyi, sosyal bir potansiyelin oluşumuna ve sürdürülebilirliğine katkıda bulunabilmeyi sağladığından, kendine has bir sosyal anlamlar bütünlüğü de oluşturabilmektedir. Bu kültürel ortam, aynı zamanda onun sanatın, estetiğin ve tasarımın bir karışımı olduğunu da göstermektedir.

3. Postmodernite Kuramı

Modernite kavramı ve bu kavramla ilgili çeşitlemeler, kültürel anlamlandırmalar veya tanımlamaların referans noktaları siyasal, ekonomik, teknolojik ve kültürel alanlardaki önemli dönüşüm hareketlerine bağlıdır. Bu anlamda modernite kendinden öncekinin tersine, aydınlanma hareketlerinin arka planını oluşturan kültürel ve sosyolojik bir yapı sergilerken, sonraki zaman diliminde yerini, modernite ötesinden günümüze yayılan bir zaman diliminin

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günlük yaşam anlatılarının tanımlaması olarak gelişen ve postmodernite ile tanımlabilen bir yapıya dönüşmüştür. Modernite her türlü aşırılıktan uzak bir biçimselliği hedef almaktadır.

İletişimbilimci Habermas "postmodern, 19. yüzyılın ortasından beri kültürel moderniteye tepki olarak gelişen etkili tutumları çok göze batmadan miras edinen bir slogan mıdır?" (1996: 38) şeklinde bir soruyu gündeme getirirken –postmodernistlerden farklı olarak- modernitenin postmoderniteye olan etkisine dikkati çekmeye çalışır. Birbirini etkileyen kültürel ve teknolojik etkilerle tanımlanmaya başlanan postmodernite, daha çok yeni medya, tüketim referansları ve iletişim biçimleri ile oldukça karmaşık bir anlamla, yüzyılımızdaki toplumsal yapıları kültürel olarak okuma veya tanımlama eğilimindedir. Bu karmaşık yapıda öznelliğin, imgelerin ve anlamların ilişkilerinin çözümlenmeye çalışıldığı görülür. "Postmodernite, kendisini bir 'hiper-gerçek' olarak toplumsal ilişkilere dayatır ve kabul ettirir" (Sarıbay, 1995 : 89). Bu doğrultuda yeni medya, artık, hiper-gerçekliğin, üst-gerçekliğin ya da simülasyonun oluşmasını sağlayan postmodern ortamların çoğaltılması için çabaladığı söylenebilir.

Öte yandan "postmoderniteden söz etmek, kendine özgü örgütleyici ilkelere sahip yeni bir toplumsal totalitenin ortaya çıkışını ima eden bir çağ değişikliğini ya da moderniteden kopuşu ileri sürmek anlamına gelmektedir. Lyotard, Baudrillard ve bir ölçüde Jameson gibi düşünürler için bu tür bir kopuş gerçekliğin imajlara dönüşmesi, medya ve kültür ürünlerinin postmodern duyarlılığın merkezine yerleşmesi, zamanın bir dizi ebedi şimdiler halinde parçalanması gibi durumları çerçeveleyen postendüstriyel çağ yönünde gelişen bir harekettir" (Özer ve Baştan, 2012: 4). Bu hareket sürecinde Baudrillard'a göre bireyin, yeni medya ile bütünleştiği içsel dünyasında simülasyon'la gerçek hayattan koptuğu öngörülmektedir. Modernizm felsefesinin tersine, öznelliği, çoğulculuğu, kamusal bireysel, yerel anlayışları önemseyen ve bu doğrultuda özgürleşmeyi öneren postmodernitenin etkileri bir çok alanda kendini göstermiştir. Bu doğrultuda postmodernizm, tüketim kültürü, kitle kültürü, sanat, pedagoji, ekonomi ve sosyoloji gibi alanlardaki dönüşümlere de etki etmiştir. Postmodern kültür anlayışı yeni medya ile öznelliğin güçlenmesi doğrultusunda önemli gelişmelerin de başlangıcı olmuştur. "Modernitenin tarihsel kökeni Batı dünyasında Rönesans, dinsel alanda Reform, sınaî kapitalizmin hazırlık fazlarını (merkantilizm, coğrafi keşifler, kolonyalizm, liberal düşünce sistemlerinin gelişimi vb.) içerecek biçimde 16. ve 17. yüzyıllara kadar gitse de, yüzyılların birikiminin bir sonucu olarak 19. yüzyıl sonları ile Batı kültür hayatını tamamıyla kuşatan ve tanımlayan bir değerler dizisi haline dönüşmüştür" (Rosenau,1992;

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Norris 1995; Wagner, 2008, 83–103, akt. Özer ve Baştan, 2012: s.1). Postmoderniteye dair genel bir değerlendirmede, kuramsal olarak yapılan tartışmaların daha çok, zamanlaştırma ya da dönemleştirmeye dair olduğu görülmektedir. Bununla birlikte zamanlama olarak tartışmaların devam etmesinin temelinde ise yine iletişim kültürünün ve yeni medyanın etkilerinin olduğu özellikle vurgulanmalıdır.

4. Üst-Gerçeklik Kuramı ve Yeni Medyanın Sosyolojik Eylemi

Yeni medya ve tüketim sosyolojisi üzerine yapılabilecek her türden bir değerlendirmede, üst-gerçeklikten mutlak surette söz etmek gerekmektedir. Çünkü üst-gerçeklik kuramı, öncelikle Jean Baudrillard'ın McLuhan'dan etkilenerek, kitle iletişimi üzerine geliştirilmiş önemli bir kuramdır. Kitle iletişimi ya da konumuz açısından yeni medya kategorisinde günlük yaşama dair her şeyin kopyasının kopyası oduğu yönündeki değerlendirmeler genel olarak üst-gerçek kuramı ile ifade edilebilmektedir.

Üst-gerçeklik (simülasyon) kuramını geliştiren Baudrillard, bu kurama ilişkin tanımını, "bir köken ya da bir gerçeklikten yoksun olan gerçeğin modeller aracılığıyla türetilmesi" şeklinde açıklamaktadır (2003: 120). Baudrillard'a göre medya toplumu modeller, işaretler ve kodların egemen olduğu bir simulasyon haline getirir. Sosyolojik işlem olarak medya, gündelik yaşamda hayati rol oynayan ve özerk-hiper gerçek alanını oluşturan imajlar, işaretler ve kodlar üreten merkezi bir simulasyon araçlarıdır. "Yeni medya modern görsel içerikler başta olmak üzere, eskiye oranla çok daha kapsamlı kültürel formlar içermektedir. Günümüz yeni medyası gerçeklik yanılsaması yaratmakta ve bir tür simülasyon teknikleri oluşturmaktadır" (Manovich, 2001: 8). Böylesi bir yapıda bireyler, medyada yaratılan görüntülerle özdeşleşerek kendilerini gerçek hayatta karşılığı olmaya gerçeklik formlarıyla tanımlamaktadırlar. Baudrillard'ın medya eleştirisine yaptığı katkı, üretim ilişkilerinin gerçeğini bir yana bırakarak medyayı kavramlaştırmasında yatar. Ona göre kitle iletişimi kötü bir iletişim şeklidir ve olması gereken iletişim ise, yüz yüze iletişimdir. Baudrillard'ın yaklaşımında medya, gerçeği temsil etmez, hiper-gerçekliği oluşturur. Bir başka deyişle, medya, iletişimi imkânsızlaştıran ve yutan araçlardır (1981: 175-189). Böylece üst-gerçeklik tüketim kültürü nezdinde bir yaşam biçimi oluşturmuştur. Burada asıl olan, tüketim kültürünün yaşamın kendisini bir üst-gerçeklik alanına dönüştürdüğü gerçeğidir.

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Üst-gerçeklikle ilgili önemli bir diğer kuramcı Jameson ise simülasyonu gerçeği hiç olmayan, tıpatıp kopya olarak tanımlar ve ona göre simülasyon yalnızca yüzeysel olanın ifadesidir (1984: 66). Üst-gerçeklik ifadesinde gerçekliği bulunmayan bir model, artık gerçekliğini yitirmiş bir modeldir. Buna göre gerçekliği olmayan modelde aslı olmayan, bulunmayan bir model söz konusudur. Sonuç olarak tüketilen model de gerçek olmayan bir modeldir. Böylesi bir gerçeklik yoksunluğunda üst-gerçeklik bu durumu kuramsallaştıran ve ifadelendiren bir kavramdır. Kültürel tüketim ritüellerinde böyle bir açıklama getirilen üst-gerçeklik kavramı, yeni medyanın günlük yaşamın her anı için bir çok işlem ürettiği çağımızda Debord'un ifadesiyle, gerçeğin dönüştüğü dünyamızda kitlelerin gündelik hayatlarında birer gösteri toplumuna dönüştüğü gerçeği ortaya çıkmaktadır (1996: 12). Yeni medya ile işlenen modellerin gerçekte, gösteren oldukları ve dolayısıyla asıl modellerin niteliği ile de tanımlanamayacağı şeklinde bir üst-gerçeklik fikri ile asıl model ile görünenin yer değiştirmesi fikri ve mantıksızlığı üzerine postmodern bir yaklaşım geliştirilir. Çağımızda yeni medya ile canlandırılan üst-gerçeklik alanında, tüketim kültürüne bağlı olarak gelişen görsel kültür ve görsel tüketim unsurlarının birer okuryazarlıkları ilgilendiren yapısal içerikleri, bütün bireyleri üst-gerçekliğin işleminden geçirdiğinin bir diğer ifade şeklidir.

5. Yeni Medyaya Postmodern Yaklaşım: Yeni Medya İle Oluşturulan Yeni Sosyal Anlamlar Konusu

Yaşam biçimi kitle toplumu için önemli bir sosyolojik olgudur. Kitle olarak yaşamın gerektirdiği paylaşımlar ve iletişim biçimleri ise sosyolojik olarak bir takım anlamların üretimi ve yaratımı ile mümkün kılınmaktadır. Toplumsal yaşamda var olmak için gerekli olan sosyalizasyona dahil olan ve bunun önemini bilenler için anlam, toplumsal yaşama uyum sağlamanın bir göstergesidir. Buna göre bütün bireyler sosyalizasyonun kapsamı içinde toplumsal anlamların ve anlamlandırmaların birer parçası konumunda olmak istemektedir. Sosyolojik açıdan incelendiğinde insanlık tarihi, bireysel ve toplumsal olarak insanların anlam üretme gayretlerini işleyen bir tarihtir. Çağımızda bütün insanların ortak özelliklerinden birisi kitle iletişim araçları ile etkileşimleridir. Günümüz insanının bu bariz özelliği onu anlam yaratıcı pozisyonuna itmiştir. Ancak anlam üretimi dışavurum ile mümkün olmaktadır. Bir anlamın üretilmesi için öncelikle toplumsal bir etki yaratması gerekmektedir. Paylaşımlar ve etkileşimler sonuncuda kitlesel olarak oluşturulan anlamlar sonuç olarak toplumsal bir söyleme/eyleme dönüşmektedir. Sosyal paylaşımların anlama dönüşmesi için belirli süreçlerden geçmesi gerekir. Bu süreçte bir takım kodlar, okumalar ve çözümlemeler söz

konusudur. Dolayısıyla anlam üretiminde olaylara ve dünyaya bakış açısı da önemli olmaktadır. Bu durumda anlam yaratmak bizatihi yaşamın içinde yer almaktır. Denkel'e göre "anlam bir düşünce değil, düşünceye içerik olan ve herkesin gözlemine açık gerçek bir olgudur" ve toplumsal gerçekliği yansıtır. Kitle kültürü, sosyal medya, Sosyal Ağ Kuramı, Facebook, Twitter ve Instagram günümüzün sosyal anlam üretiminin ve dolaşımının mümkün olduğu ortamlardır. Yeni medya yoğun bir şekilde sosyal anlam üretimine olanak sağlamaktadır.

5.1. Kitle Kültürü ve Yeni Medyanın Kitle Kültürüne Desteği

Kitle kültürü kavramı modernleşme olgusuyla birlikte eşzamanlı bir gelişme göstermiştir. Modernitenin gelişmesiyle ortaya çıkmış olan bu kitle kültürü kavramı, sosyolojik olarak halen gelişme göstermekte olan bir kavramdır. Bilgi ve kitle iletişim araçları ile ilgili gelişmeler modern yaşam olgusunu ve modern yaşamın birey üzerindeki sosyolojik etkilerini önemli ölçüde etkilemiştir. Kitle kültürünün bir diğer özelliği küreselleşen bir forma sahip olmasıdır. Sosyal anlam üzerinden hayatın bütün formlarını pekiştirmiş bir kültürü yansıtan kitle kültürü, popüler kültürün bir yansımasıdır. Kitle iletişim araçları veya konumuz itibarı ile yeni medya, kitle kültürünün gelişmesinde önemli bir araç özelliği taşımaktadır. Yeni medya sayesinde her türlü kültürel formlar günümüzde kitle kültürü adı altında genel bir ifade ile tanımlanabilmektedir.

“Benjamin’in 20. yüzyılın başında yapmış olduğu analizler günümüzün teknolojik olanaklarıyla bir adım daha ileriye gitmiş, kültürün yapısında yeni bir değişimi beraberinde getirmiştir” (Başlar, 2013: 3). Karmaşık, değişken statüler topluluğundan meydana gelen kitle kültürünü sosyalizasyon sürecindeki normal –öğrenme yoluyla öğrenilen süreci- kültürel formlardan ayırmak gerekmektedir. Çünkü kitle kültürünün varlık nedeni, endüstrileşme ile orantılıdır. Doğal olarak bu gücün sosyal ve ekonomik olarak iktidar olanın gücünü ve etkinliğini artırması da kaçınılmazdır. Ekonomik, sosyal ve kültürel olarak bir iktidarı barındıran toplumların ise kitle toplumu şeklinde tanımlanması söz konusu olmaktadır. Kitle toplumu, kapitalizmin ilk aşaması olan Sanayi Devriminin 1700’lü yılların sonlarına doğru İngiltere’de başlaması sonucunda ortaya çıkan bir kentleşme olgusudur. Kitle toplumu: “kitleselleşmiş insanların oluşturduğu, insanlar arasındaki başlıca ilişki biçiminin kitle iletişim araçlarıyla gerçekleştiği modern toplumsal formasyonu dile getirmek için kullanılan bir nitelemedir” (Mutlu, 1995, 213). Yaşam biçimlerinin benzerleştiği, günlük deneyimlerin paylaşıldığı yeni medya kitle kültürünün ortaya koyduğu bir olgu olarak dikkati çeker. Yeni

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medya, kitle kültürünün temel araçları konumundadır. Medya aradan geçen yıllar boyunca başta teknoloji ve sanat ilişkisi ile teknik ve estetik açıdan olağanüstü bir gelişme göstermiştir. İlk olarak, görsel tasarımlar yoluyla üretilmiş olan medya, günümüzde çok karmaşık ve iç içe geçmiş son derece fonksiyonlu ve etkileşimli sistemlerle ifade edilir duruma gelmiştir. İletişim biçimlerinin yaşam biçimlerine olan etkileri sonucunda medyanın, toplumsal anlamlara olan etkileri olağanüstü bir şekilde gelişme göstermiştir. Yeni medya, bol eşya, bol zaman ve bol tüketim duygusu yaratmıştır. Ama hiç bir zaman hiç bir şeyin gereksiz yere bol ve kalabalık olduğu imajı anlaşılmaz. Ve yeni medya tarafından yaratılan kitle kültüründe insanın dört bir yandan kuşatıldığı fark edilemez.

5.2. Sosyal Değişim

Günümüz toplumsal yapıları birçok açıdan değişime ve dönüşüme açık bir karakter ortaya koymaktadır. İnsanın geçmişi ve şimdiyi bilme ve keşfetme arzusu ile birlikte bunun için geliştirdiği ve kullandığı kültürel argümanlar bizi toplumsal gerçekliğin önemli bir sonucu ile karşı karşıya bırakır: sosyal değişim. Aynı zamanda "sosyal değişme, geniş anlamlar içeren ve sosyal yapı ile birlikte sosyolojinin tamamını ifade eden bir kavramdır" (Arslantürk ve Amman, 2013: 405). Sosyolojide -gelişme/kalkınma, batılılaşma, ilerleme, büyüme, evrim, kültürel değişme, devrim ve modernleşme gibi- değişimi ifade eden birçok kavram yer almaktadır. Değişme, doğal ortamlar nezdinde insanın tutum ve davranışlarında belirli bir dönemi kapsayan farklılaşmayı anlatırken; sosyolojik açıdan toplumun yapısını meydana getiren etkileşimlerin ve bunları belirleyen kurumların süreç içerisindeki değişimi ise 'sosyal değişime' olarak ifade edilmektedir. "Nasıl ki toplumsal yapı bizleri etkiliyorsa, bizler de bireyler olarak onu etkileyebiliriz" (Newman, 2013: 23). Bu bakımdan sosyal değişim, toplumdaki bireyler arası etkileşimin düzeyini ve niteliğini belirleyen bir karakteri ortaya koymaktadır. "Sosyal yapı, toplumda yeri olan bütün kurumlar ve değerler sistemini kapsayan statik bir durumu belirtirken; sosyal değişme, bu kurumlar ve değerler sisteminin gösterdiği dönüşümleri anlatan dinamik bir karakterdir" (Arslantürk ve Amman, 2013: 405). Toplumların yapısını oluşturan ilişkiler ve etkileşimler ağının, bireylerin ve kurumların oluşturdukları davranış modellerinin ve yöntemlerinin diğer dönemlere göre ortaya koyduğu farklı değerler bütünlüğü olarak "sosyal değişme terimi, toplumun temel kurum ve örgütlenişindeki kaymaları ifade eder" (Arslantürk ve Amman, 2013: 405). Bir anlam bütünlüğünde bir araya gelen insanların örgütlenmesi ve kullandıkları dil ve iletişim biçimleri gibi. Teknolojik gelişmeler ve yenilikler, şehirlerin gelişimi, kent yaşamı, bilgi ve iletişimdeki gelişmeler, kültürün ve toplumsal kurumların zaman içindeki dönüşümleri sosyal değişimin

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boyutlarını anlatmaktadır. "Her türlü hareketlilik zorunlu olarak bir referans noktasını gerektirir. Sosyolojik bir kavram olarak 'sosyal değişme'nin referansı mevcut toplumsal yapıdır" (Arslantürk ve Amman, 2013: 405). Teknolojik faktörler, kültürel faktörler, fiziksel çevre ve modernizm toplumsal değişmeyi meydana getiren ve ölçülendiren etkenlerdir. Etkenler açısından Newman (2013: 627), sosyal değişim sürecinin dört özelliği olduğundan söz etmektedir:

- Sosyal değişim süreklidir.
- Sosyal değişim bazen kasıtlı ancak çoğunlukla plansız gerçekleşir.
- Sosyal değişim karşıtlık içerir.
- Sosyal değişimde bazı değişimler diğerlerine göre daha önemlidir.

Toplumsal açıdan sosyal değişim sonuç olarak bir davranış biçimi ve iletişim biçimi ortaya koymaktadır. Bu türden bir toplumsal ve bireysel davranış modelinin ve sonucundaki sosyal değişmelerin yarattığı etkilerin sonuçlarının sosyolojik kuramsal açıdan açıklaması yapılacak olursa, toplumsal ve bireysel anlamlandırmaların, anlam üretimlerinin, anlam kaymalarının sosyal değişimdeki rolü kaçınılmaz olmaktadır. Bununla birlikte anlam üretimi ve anlamların tüketimi açısından, çağımızın toplumsal yapılarının oluşumunda, etkileşiminde ve örgütlenmesinde son derece etkili olan yeni medya tüketimi sosyal değişimin önemli bir etkeni durumundadır.

5.3. Sosyal Medya ve Yeni Yaşam Biçiminin Postmodern Zemini

21. yüzyılın sosyal ilişkilerinde ortaya çıkan dijital iletişimin alternatif iletişim biçimleri ve günlük yaşam standartlarını belirleyen bir nitelik olarak karşımıza çıkan sosyal medya kavramı, dünyadaki insan nüfusunun önemli bir bölümü ile ilişkili bir kavramdır. Bu nedenle, sosyal medyadan söz edilmesini sağlayan en önemli gelişme internet ile ilişkilidir. "İnternet, bir iletişim aracı olmanın ötesinde bir toplumsal mekandır. Bu mekan yeni toplumsal ilişki biçimlerinin yaratılmasında aracı olmaktadır" (Poster, 1997: 206). İnternet ve makan ilişkisinin oluşturduğu yeni sosyal gerçeklikte birey internet ile kendi mekanını sanal olarak kendisi oluşturmaktadır. Bu durumda, oluşturduğu sanal mekansal uzamda nerede, nasıl, ne zaman ve ne şekilde olmak ve ne yapmak istediğine birey kendisi karar vermektedir.

Sosyal medyayı bu kadar etkili ve önemli kılan özelliği, hemen hemen her şeyin paylaşım ortamı olarak görülmesinden kaynaklanmaktadır. İçerik toplulukları, forumlar, bloglar ve sosyal ağlardan meydana gelen sosyal medyanın en önemli argümanı sosyal ağlardır. Sosyal

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ağlar, içerik oluşturmaya ve bunları paylaşmaya imkan verip iletişimi sağladığından en çok tercih edilen sosyal medya seçeneğidir. Bir bireyin günlük olarak yapabileceği bir çok aktiviteyi gerçekleştirme imkanı veren sosyal medya bu nedenle son derece hızlı bir gelişme ortamı oluşturmaktadır. "Çevrimiçi iletişimin kaliteli hizmet sunması, konfor sağlaması ve düşük maliyetli olması sosyal paylaşım alanlarının katılımcılarını arttırır" (Miller vd., 2009: 305-322). Daha çok bilgi edinebilme, daha çok etkileşim, daha çok eğlenme ve hoşça vakit geçirme eğilimindeki bireyler için internetin sağladığı bu ortam, özellikle teknolojinin gelişmesi ve ucuzlaması ile kapsam olarak da gelişme göstermiştir. Sosyal ağlar bu bakımdan sosyal medya kullanıcılarına sınırı olmayan bir dünya, hatta uzam sunmaktadır. Bunun için "yeni medya kullanıcılarını uzayda bir yarış araması sürücüsü konumuna getirmiştir" (Bolter ve Grusin, 1999: 5). İnternet, kullanıcısına her hangi bir güçlükle karşılaşmadan zaman, mekân ve coğrafi sınırlılıklar veya ölçüleri ortadan kaldırarak küresel bir ortamda özgürce hareket alanı sunmuştur.

Sosyal medya ortamının en önemli özelliği yalnızca iletişim ya da etkileşim imkanlarıyla ile sınırlı olmayıp, gerçek yaşamın yaşanabilir pek çok öğesini bireyin yaşamına dahil etmesidir. Bu bakımdan sosyal medya küresel iletişimin ve katılımın mümkün kılınabildiği bir niteliğe kavuşmuştur. Gerçek yaşamda ekonomik, zaman, mekan ve fiziksel nedenlerle gerçekleştirilemeyen pek çok eylem, sosyal medya aracılığı ile hiç bir maliyeti olmadan gerçekleştirilebilmektedir. Sosyal medya oluşturduğu ortamlarla gerçekliğe bakışı ve sosyal iletişim biçiminin de dönüşümüne neden olmuştur. Baudrillard'a göre sosyal medyada yaratılan "sanal mekânlar, sosyalleşmede gerçekliğe olan bakışı dönüştürmüş, sahtenin gerçeğin yerine geçmesine neden olmuştur (1991: 22). Sahtenin gerçeğin yerine dönüştüğü her türden ortam, postmodern tüketicinin kendini bulduğu yeni bir ortam olarak ortaya çıkmış ve bir tüketim biçimi olarak tanımlana gelmiştir. Günlük yaşam deneyimlerine bütünüyle egemen olmaya çalışan ve her türden insan deneyimi için alternatif sistemlerle kendini yenileme eğilimi gösterebilen sosyal medya, kurgu, sanal ve gerçeklik ilişkisinde günümüz bireyi için ayrıca gerçek dışı sanal bir kimlik oluşumuna da neden olmaktadır. Kurgu ve sanal olanla gerçekleştirilen sosyal ilişkiler zamanla özde, bir kimlik sorunu yaratmıştır. Bu nedenle sosyal medya birey davranışları açısından tutarlı tutarsız birçok eyleme de sahne olmuştur. Sosyal medya bireylere yeni ve etkin bir iletişim ortamı sağlamakla birlikte kimlik, cinsiyet ve sosyal ilişkiler üzerine etkileri halen tartışılan ve araştırılan bir çalışma alanıdır. Mitchell'e göre sosyal medya, "bir taraftan büyülü mistik bir çevre oluştururken, diğer taraftan riskler yaratıyor. Bu risk daha çok okuma yazma bilmeyen, eleştirisi olmayan çocukları ve kitleleri

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etkiliyor" (2005: 7). Bu bakımdan sosyal medya tüketiminde kazanılmış kimliğin, sosyal statünün ve öğrenim durumu oldukça önemlidir. Günümüzde milyonlarca kullanıcı gerçek kimlikleri ve sanal kimlikleri ile sosyal ağlar üzerinde çevrimiçi olarak yer almaktadır. Sosyal medya kuramı aşağıdaki sosyal ağ kavramlarıyla ayrıca ele alınmaktadır.

5.4. Sosyal Ağ Kuramı: Facebook, Twitter, Instagram ve Diğerleri...

Deniz aşırı iletişim kablolarının ve yerel ağ kablolarının kurulması, bilgisayar ve telekomünikasyonun teknolojik olarak gelişmesi sosyal ağ kuramını ve bununla ilişkili olarak ortaya çıkan kavramları sosyolojik ve pedagojik olarak tartışmaya açmıştır. "Bütün öngörülere rağmen, 50 yıl önce hayal bile edilemeyecek bir dijital patlamaya tanık olduk" (Vogt, 2011: 16,17). Sosyal ağ, kitle iletişim araçları ile sağlanan sanal ortamlarda sosyal iletişim kurmaya yarayan bir iletişim ağıdır. Bu bakımdan sosyal ağ kuramı, sosyal iletişim sürecinin gerçekleştirildiği ortamları ifade eder. Örneğin facebook, twitter ve instagram gibi sosyal ağlarla bireyler ikili olduğu gibi aynı anda milyonlarla iletişim kurabilmekte ve paylaşımlarda bulunabilmektedir. Bireyin kendine özel kurduğu dünyasını diğerleri ile paylaşma ve diğerlerinin dünyalarını paylaşma ortamları olarak sosyal ağlar, doğal olarak dijital, sanal bir iletişim dünyası ve kültürü meydana getirmiştir. Teknolojilerin internet kullanımına imkan vermesi ile birlikte kültürel dönüşümler başlamış, bir çok birey sosyal ağlar üzerinden etkileşimde bulunarak, bu sistemin ne kadar gelişmeye açık olduğunu göstermiştir. "1993 ile 2003 arasında geliştirilen Web 1.0 sistemi okuma ve araştırmaya imkan verirken, 2004 yılından sonra Web 2.0'nin geliştirilmesi ile birlikte sıradan internet kullanıcılarına özel bir yazılıma ihtiyaç duymaksızın içerik üretme ve paylaşma imkânı doğmuştur. Günümüzde popüler sosyal paylaşım siteleri dahil olmak üzere web tabanlı sitelerinin tamamı ortaya çıkan bu teknolojinin bir yansımasıdır" (Laughey, 2009: 166). Kullanıcı sayısının artmasıyla doğru orantılı olarak paylaşımcılarını heyecanlandıran ve bu nedenle neredeyse bütün zamanlarını alan web tabanlı siteler, yaşam biçimlerinin, duyguların, anlamların paylaşıldığı sanal gerçeklikler olarak halen gelişme göstermektedir.

Bireyler günlük deneyimlerini ve paylaşmaya değer bulduklarını sosyal ağlarda özgürce paylaşabilmeyi kültürel bir yaşam biçimine dönüştürmüş durumdadır. 21. yüzyılın hemen başından itibaren yeni medya sistemlerinin özellikle bir araç üzerindeki bütünsel yapısı durumundaki multi-medya sosyal ağların kullanım kültürünün gelişmesine önemli ölçüde etki etmiştir. Sosyal ağların bireysel ve kurumsal örgütlenmeler açısından gösterdiği kullanım grafiği her geçen gün artmaktadır. Bilgi ve paylaşım akışının çift yönlü bir biçimde

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gerçekleştiği sosyal ağlar, günlük yaşamın her anında alternatif seçenekler sunarak bireyin her durumda sosyal ağlara bağlanabileceği gerçeğini yansıtmaktadır. Sosyal ağların kültürel olarak genel yaşamda yakaladığı ivme, onu insanın olduğu her türlü ortama kadar taşımıştır. Bu nedenle çağımız kuşağı hakkında dijital ağ kuşağı şeklindeki tanımlamalar gerçekleştirilmiştir.

Sosyal ağ kuramı, sosyal anlamların üretildiği ve paylaşıldığı ortamlardır. Sosyal ağların ilk örnekleri olan e-posta grupları çevrimiçi ilk sosyal örnekleri, toplum içinde dolaşıma sokulan anlamın paylaşım etkilerini de genişletmiştir. E-posta gruplarının ardından twitter ve facebook, bloglar ve wikiler gibi sosyal ağ siteleri etkileşimi eskiden olduğundan çok daha yoğun ve etkili olarak gerçekleştirdiğinden sosyal anlamların üretiminin de gerçekleştirilme olasılığı güçlenmiş ve paylaşımını arttırmıştır. Kitle iletişimini sağlayan dijital anlamlar ve sosyal anlamların bir arada küresel olarak dalaşımının mümkün olduğu sosyal ağlar, bütün katılımcılar için eşit düzeyde bir web tabanlı hizmet sunmaktadır. Sosyal ağlar aracılığı ile oluşturulan yeni kimlikler, gruplar, kitleler ve cinsiyet tanımlamaları bütünüyle, küresel paylaşımın temel öz profilini oluşturmaktadır. Küresel paylaşımın temelinin bu kadar güçlü olması ve bütün bireylere özelde bir anlamda egemenlik vadetmesi, sosyal anlamlara yönelik yeni tanımlamaların hızla geliştirilebileceği yönündeki öngörülerimizi de kuvvetlendirmektedir.

6. Post-Modernitenin Medya Tüketimine Yaklaşımı: Yeni Medya ve Üretilen Yeni Sosyal Anlamlar İlişkisi

1965'ten bu yana dünyanın kültürel, teknolojik ve sosyal yapısana yönelik olarak, 'küresel köy' ve 'bilgi çağı' ifadelerini en sık tekrar eden ve günümüze kadar aktaran İletişim Kuramcısı McLuhan'ın (1994: x) medya teorisi gerçekleşmiştir. McLuhan'ın günümüzün sosyal gücü durumuna gelen medyanın hiper-gerçekliğin mesajı olduğa ilişkin teknolojik deternizminin yeterince gerçekleştiğini görüyoruz. Sosyal ağlar ve bağlamlar yoluyla kullanıma giren "mekanik teknolojiler önemli bir etkiye ulaşmıştır. Medya organları yoluyla, mekânik teknolojilerin uygulamaları büyümüştür. Böylece teknolojik simülasyonlar son safhaya kadar ulaşmıştır" (McLuhan, 1994: 3). Medya sayesinde adeta "önemli bir varlık haline dönüşen teknoloji insanoğlu için bir koltuk değneği vazifesini görmektedir" (Zielinski, 2006: 6). Yeni medya bütünüyle yaşamın her türden deneyimlerine simülasyonlar üretme ve bunu gerçekçi bir şekilde sunma eğilimindedir. Dolayısıyla, "teknoloji kültürü her şeyi etkiler

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olmuştur" (Zielinski, 2006: 3). Yeni medyayı toplumsal olarak bu kadar etkili kılan ve kitlesel olarak bu kadar yoğun bir şekilde kullanılmasını gerektiren nedenlerin dayanağı da aynıdır. Günümüze ait hemen her mesleki deneyimin ve yaşam öyküsünün kriterleri arasına girebilen yeni medya cazibesi, küresel postmodern kültürün ve sosyal anlamların ortaya çıkmasına ve yayılmasına neden olmuştur. "Bugün yeni bir ortamın ortaya çıkmasına ve gelişmesine tanıklık ediyoruz. Bu teorisyenler ve medya tarihçileri açısından bir değerlendirme konusu oluşturmaktadır" (Manovich, 2001: 6). Yeni medyanın postmoden kültürü altında gelişen tüketim tercihleri, iletişim, bilgi edinme ve eğlence dünyasının yanı sıra, moda dünyasındaki hareketli, değişken ve etkileyici bir üslup sergileyerek tüketicisine daha önce karşılaşmadığı ortamlara girmesini ve buralarda özgürce hareket alanı sağlamasına neden olmuştur. Zielinski'ye göre, "medya sınırsız bir güçtür" (2006: 4). Yeni medyanın sınırsız etkisinde toplumların bir tür karmaşa tehdidi altında olduğu düşünülebilir. Bu karmaşa, kültürel çalışmaların ve sosyolojik çalışmaların konusu olarak, gündelik hayatın üsluplaştırılması yoluyla gündelik kültürün yapısını da dönüştürmektedir. Yeni medya ile kültürel ürünler yapısal olarak dönüşüme uğramaktadır. Yeni medyanın bütün özelliklerinin yapısal olarak bilgisayar ortamında bütünleşmesi, Manovich açısından yeni medyayı oluşturan yapı hakkında öne sürdüğü, bilgisayar ve kültürel katmanlar fikrini geliştirmesine neden olmuştur. Manovich'e göre bilgisayar, bireyin dünyayı modelleyiş tarzına ve bunlar üzerinde işlem yapabilmesine imkan tanıyarak kültüre olan etkisini gösterirken; oluşan kültürün de aynı şekilde, bireyin dünyaya olan yaklaşımı ve algılayışına etki ettiğinden bilgisayar kültürünü de etkiler. "Günümüz ve geleceğin medyası çok daha karmaşık, analitik bir çözümlemeye gereksinim duyacaktır" (Manovich, 2001: 7). Manovich'in sözünü ettiği karmaşa yeni medyanın günlük yaşam kültürü ve bu kültürün bireyler üzerinde yarattığı sosyolojik etkileri ile ilgilidir. Günlük yaşamda yeni medyanın kullanım pratikleri bu gerçeğin hangi boyutlarda olduğunu açık bir şekilde göstermektedir ve Vogt, yeni medya istatistiklerinin akıllara durgunluk verdiğini belirterek aşağıdaki kullanım pratiklerini açıklar:

- Ortalama birAmerikalı iş dışında bilgisayarda ayda 66 saat harcamaktadır.
- İnternetin en popüler web sitesi Facebook'un günlük 500 milyon kullanıcı vardır. Facebook bu kullanıcı sayısıyla, Çin ve Hindistan'ın ardından üçüncü büyük bir ülke gibidir. Facebook kullanıcıları 30 milyar adet içerik paylaşarak, her ay için 700 bin dakika harcamaktadır.
- YouTube 2 milyar videoyu kapsamaktadır. Ve her dakika, yeni videolar yüklenmektedir.

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- Şarkıcılar Lady Gage, Justin Bieber, ve Britney Spears her birinin 6,5 milyonun üzerinde Tiwitter takipçileri vardır. Herhangi bir mesaj, 'tweet' anında milyonlarca kişiye ulaşmaktadır.
- İnternet muhafazakâr tahminlere göre, 200 milyondan fazla bloglar bulunmaktadır. İnternet kullanıcılarının yüzde 75'inden fazlası düzenli blogları takip etmektedir.
- Neredeyse Amerikalıların yarısının bir Web portalı bulunmaktadır.
- Amerikalıların yüzde yetmişikisi – gençlerin yüzde 87 oranında da dahil olmak üzere - metin mesajlaşma yoluyla iletişim kurmaktadır. Geçen yıl, Amerikalılar 1,8 trilyon kısa mesaj göndermiştir. (Vogt, 2011: 18,19).

Yeni medyanın bilgisayar ve dolayısıyla internet üzerinden yarattığı etkileri ve tüketim oranlarını dikkate alan ilk kurumlardan birisi çok ilginç tir ki, vatikan olmuştur. Vatikanın toplumsal gelişmelere olan pek çok yaklaşımında olduğu gibi, "kilise bu yeni medyayı kabülde gecikmedi. Vatikan Web üzerinde birçok Kilise belgelerini kullanılabilir hale getirdi ve 1995 yılında internetin en erken sitelerinden birini yaratmıştır" (Vogt, 2011: 16). Bu örnekte olduğu gibi yeni medya, sosyal gerçekliğin her bir aşamasında tüketicinin başvurabileceği ve bulabileceği kurumsal bilgilerle de doludur. Ancak Vatikanın yeni medyaya olan yaklaşımı oldukça ilginçtir: "Günümüz medyası, parlak yıldızların altında bir yaşamı öngörerek, bir tanrı rolü oynamaktadır. Saflığını ve sevgisini göstermek için ise silahını bir haç gibi kullanmaktadır" (Vogt, 2011: 15). Günümüz toplumlarında her şey görüntüye ve eşyaya ve hayale dönüşmüş durumdadır. Yeni medya geniş bir anlamda tüketim ve sosyal iletişim ve etkişeminin nesnesi olmuş durumdadır. Bu süreçte yoğun olarak etkileşimi gerçekleştiren ve sağlayan imge ise çoğu zaman görsel imajlardır. Dolaylı olarak ortaya çıkan bir anlamda tüketim imgesi ya da simgesi olduğu da söylenebilir. Ayrıca bu soyut bir tüketim olarak da ifade edilebilir. İmajı tüketmek gerçek anlamda bir soyut tüketimdir. Bir hayalin üretimi çok çeşitli şekillerde mümkün olabilir ve bunun tüketimi de aynı şekilde farklılık arzedebilir. Yeni medya ile günümüzde yapay olan her şeye pahabiçilemez değerler yüklenmektedir. Günümüz tüketim toplumunda her şey hayale, görüntüye ve gösteriye dönüşmüş durumdadır. Eşyanın yerini tasviri, aslının yerini kopyası, gerçeğinin yerini ise temsili almıştır. Yeni medya doğal olarak bir kitle kültürü yaratmaktadır. "Multimedya kültürel formlar için bir tür ara yüz oluşturmuştur" (Manovich, 2001: 7). Söz konusu bu ara yüz ise bütünüyle postmodern bir yapıyı ortaya koymaktadır.

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Nesnel bir gerçek olarak var olsa da toplum, onun etkisi ve kontrolü altındaki bireylerin yaşam biçimleri ile anlam oluşturulmaktadır. Bu oluşum, bireylerin günlük etkileşimlerinde yeni medya tarafından yeniden yenilenip şekil alması ile gelişir. "kültürelarası etkileşimin artığı ve geliştiği bir evrede, medya operasyonel olarak bir şok etkisi yaratmıştır" (McLuhan, 1994: 7). Bütün bireylerin istediği kişi, kurum ve bilgiye ulaşması mümkün olmuştur. "Modern toplumda bilgiye sahip olmak iktidar olmaktır" (Bauman, 2003: 62). Sanal olarak birey istediği durumda ve yerde bulunabilmektedir. Yeni medya gerçekliğin dünyasını kültürel olarak dönüşen ve kültürel kalıpları belirlenmiş olan ve sürekli aynı şekilde gelişmeye açık olan üst-gerçekliği, postmodernist bir kültürel kalıp içinde yer alan anlamların dünyasına doğru itmektedir. Bu nedenle yeni medya toplumsal ilişkilerde olağanüstü bir anlatım dili ve kimlik üstlenmiştir. "Teknoloji, medyanın sosyal desenleri biçimlendirici gücünü ortaya koymuştur. Bu, toplum için bir tür doğal kaynak gücündedir" (McLuhan, 1994: 21). Milyonlarca paylaşım sonucunda oluşan ve kitlesel bir sonuç olarak ortaya çıkan bir dil olarak sosyal anlam bütünlükleri ister iletişim dili olsun isterse kültürel bir dil olarak olsun, geriye kalan toplumun çok üstünde bir etkiye ve güce hakim olmaktadır. Kullanıcıları için yeni medya önemli ve en güçlü bir toplumsal güç durumuna gelmiştir. "Sosyal değişimler, zaman içinde meydana gelen, -nüfus artışı ve kentlere göç gibi- çok çeşitli toplumsal güçlerin etkisiyle gerçekleşmektedir" (Newman, 2013: 233). Eskiye oranla göçer toplumların çok daha az olduğu çağımızda yeni medya sosyal değişimleri etkileyen en önemli toplumsal güç durumundadır. Sosyal ve kültürel değişimler için yeni medya her bireyin dünyayı görebildiği, izleyebildiği, etkinliklere katılabildiği, eleştirebildiği, tanımlanabildiği bir ortam yaratmıştır. Öyle ki Macionis'e göre, "yeni medya ile herkes dünyayı sosyolojik olarak görebiliyor" (2013: 5). Böylece pedagojinin yapamadığını yeni medya gerçekleştirmiştir. Birey yeni medya ile gerek kendini geliştirmekte ve gerekse dünyadaki sosyal değişimlerin ve dönüşümlerin bir parçası olabilmektedir.

7. Tartışma ve Sonuç

Küresel güç, küresel iletişim, küresel ekonomi, küresel köy ve buna benzer ifadeler iletişim teknolojileri bağlamlı anlamlandırmalar sonucunda geliştirilmiş yaklaşımlardır. Anlamın ve anlama verilen değerin veya kültürel kıymetin öznelden nesnele olan sürecinde kitlesel ve küresel yorumlamalar ve değerler ortaya çıkmaktadır. Bütün bireyler için yaşamın bir tür ifadesi olan anlam, yaşamın bütün süreçlerinde bireyin buna göre hareket etmesini sağlar ve kültür olarak tanımlama kazanır. Birey için öznel olan anlam yeni medya ile küresel bir boyut kazanır. Postmodern küresel kültürün oluşmasında olduğu kadar yayılmasında da en etkili unsur durumundaki yeni medya, gerek bireyler arası etkileşimi sağlayan sosyal ağlarla ve

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gerekse duygu ve düşüncelerin ortak buluşma noktaları olarak sosyal bir anlam boyutu kazanmış durumdadır. Kültürlerarası etkileşimi olanaklı kılan yeni medya, her kültürden insanı bir araya getirerek, ortak bir kültürü oluşturabilmelerini ve bu şekilde sosyal anlamların ortaya çıkmasına zemin hazırladığı görülmektedir. Böylesi bir etki ile ortaya çıkan ve kültürel bir anlam kazanan sosyal anlamların, geçmiş dönemlere göre çok daha hızlı üretildikleri ve paylaşıldıkları üzerinde durmak gerekir. Sosyal anlam, dünyanın sosyal olgularını dikkate almaktadır. Sosyal anlam, bireyin kendisi gibi diğerleri ile olumlu iletişim kurmayı önemsemesi ve bunu kitlesel olarak kullanabilmenin kültürüne dahil olmaktır. Yeni medyanın sürekli yenilenen yüzü ve tüketicinin onun bu özelliği ile ilgili ilişkileri, tarihin hiç bir döneminde, sosyal anlamların ve sosyal değerlerin bu kadar yoğun bir nüfus kitlesi tarafından paylaşıldığını ve önemsendiğine şahit olmamıştır. Yeni medya tüketicisinin her birinin önemli görüldüğü bu süreçte, bütün bireyler önemsendiklerini, dikkate alındıklarını ve bu sürecin bir parçası olduklarının farkındadırlar.

Sosyal medyanın kültürel boyutu, paylaşılan içeriklerin sosyolojik etkileri nedeniyle, dünyanın genel sorunlarını ilgilendiren birçok konuda genel kanaatlerin oluşmasına ve burada geliştirilen ve ortaya çıkan öznel anlamların, nesnel olarak bir anlam bütünlüğünün oluşmasına katkıda bulunmaktadır. Ekonomik alan, ticaret, sanat, pedagoji ve sosyal hayata dair üretilen sosyal anlamlar, yeni iletişim biçimlerinin ve dünya için yeni toplumsal değerlerin oluşmasına da etki etmektedir. Çevreci duygular, demokratik değerler gibi sosyal olguların gelişmesi yeni medya ile gelişen sosyal anlamlandırmalar olarak gösterilebilir. Yeni medyanın oluşturduğu küresel toplum veya anlayışlar bütünlüğü, önceki toplumlara göre, değişen ekonomi, politika ve kültürel paradigmalar doğrultusunda yeni bir dönem, yeni bir çağ tanımlaması meydana getirmiştir.

Gözetim toplumu, dijital –kültür- toplumu, enformasyon toplumu, küresel toplum gibi çağımızın postmodern toplum yaklaşımları aynı zamanda yeni toplumsal yapının olduğu gibi bu yapının ortaya koyduğu toplumsal hareketler için yapılan bir anlamlandırmalardır. Bilgisayar ortamında iletişim kültürü ile üretilen ve paylaşılan sosyal anlamlar, bireyin dünyayı algılayışına hükmeden sonuçları kapsamaktadır. Bu bağlamlarda çalışmamızda yeni medyanın gelişimi ve sosyal alandaki etkileri, kültürel, sosyal ve iletişimsel bakış açısı üzerinden ele alınarak; postmodernizm eklemlenme süreci tartışılmıştır. Yeni medya ve sosyal anlamlar ilişkisi ile ilgili çıkarımları aşağıdaki şekilde özetlemek mümkün:

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- Dünyanın küresel köy olduğu yönündeki yerleşik ifadelerin giderek güçlenmesi yeni medya ile sağlanan sosyal anlamlandırmaların bir eseridir.
- Yeni medya, toplumsal anlam yaratımının en güçlü bağlantı noktasıdır. Bu bağlantı, iletişim bağlamında sosyal ve kültürel anlam yaratımlarını desteklemektedir.
- Bireyin anlam çözümlemeleri, medya yollu etkileşimle gelişerek toplumsal anlam yaratımına dönüşmektedir.
- Yeni medya bireysel anlamı küresel anlam haline dönüştürerek bir bildirişim aracına da dönüşmektedir.
- Kurgu ve tasarımın endüstriyel üretime dönüşmesi ile yeni medya çağımızın kültürel yapılarını ilgilendiren önemli bir güçtür.
- Yeni medya, toplumsal yapıya ve toplumsal iletişime ilişkin bir dizge ve manipülasyon oluşturmaktadır.
- Özünde bir tüketim felsefesini çağrıştıran yeni medyanın kültürel etkilerinin gelecekte çok daha farklı etkilerle gündem oluşturacağını söylemek mümkün olmaktadır.
- Her türden anlamı keşfetmek ve çözümlemek için yeni medyanın tüketim pratiklerini ve sosyal etkilerini çözümlemek ayrıca önemli bir konuyu oluşturmaktadır.
- Kitleler tarafından önemsenen her bir anlam kültürel olarak postmodern bir yapı ortaya koymaktadır.

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Pre-Service Teachers' Perceptions Of Ict Integration In Teacher Education In Turkey

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Abstract

Information and Communication Technology (ICT) integration in teacher education and teaching practices of teachers is a complicated and challenging issue. As far as pre-service teachers are concerned, this becomes critical because they need to be equipped with the competencies for their future teaching practices. The objective of this study is to identify pre-service teachers' perceptions of ICT integration in teacher education and its association with their teaching practices. A stratified two-stage probability sampling design was used. Firstly, three Turkish state universities with the highest and lowest number of the pre-service teachers were chosen. Secondly, pre-service teachers from the subject domains of Turkish language, social sciences, elementary education mathematics and science were selected. A qualitative method was used in this study. Data were collected from 782 pre-service teachers from open ended questions in a survey and interviews were conducted with 15 participants. Qualitative data were analyzed with thematic coding. The results identified the specific conditions of ICT integration in teacher education and pre-service teachers' perceptions of ICT integration and the associations with their teaching practices.

Keywords: pre-service teachers, ICT integration, ICT competency.

INTRODUCTION

Information and Communication Technology (ICT) appear to be not only the backbone of the Information Society, but also a crucial catalyst and tool to bring about educational reforms which enable our students to be productive knowledge workers (Pelgrum, 2001). In this context, ICT seems to be an important tool to support new ways of teaching and learning (Drent & Melissen, 2008). The integration of ICT into education remains a crucial issue for both teachers and students to perform effectively. Therefore, teachers are required to be competent in the use of ICT (Voogt & Roblin, 2012; Pineida, 2011).

An important factor for teachers to integrate technology into instruction is being trained in how to integrate technology into education (Pamuk & Peker, 2009). In this regard, teacher education programs play a significant role in training pre-service teachers to integrate ICT into education. Pre-service teachers should acquire the skills and knowledge essential for ICT

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use in their pre-service learning process and apply them in their pre-service education period and in their professional life (Yapıcı & Hevedanlı, 2012). So, pre-service teachers' perceptions of ICT integration in teacher education are highly important to investigate whether the programs for teacher education are sufficient to prepare pre-service teachers to acquire and integrate ICT competence in their pre-service education and in their prospective life.

THEORETICAL BACKGROUND

ICT integration in teacher education and teaching practices of teachers is a complex and challenging issue. In this regard, Gülbahar and Güven (2008) claim that just equipping schools with the essential ICT tools does not improve the quality of instruction and does not create more effective learning environments. Nevertheless, schools should reconsider the current teaching programs, practices and resources by grasping a broader vision and philosophy. It is not simple to integrate technology successfully since it relies on interlinking variables (Akbaba-Altun, 2006). In this study, the interlinking variables, namely variables related to ICT integration in education, are examined focusing on three categories related to pre-service teachers' ICT integration into teaching practices. These categories are conditions for ICT integration in education, pre-service teachers' perceptions of ICT integration and the perceived impact of pre-service teachers' perceptions on their practices of ICT integration in education.

Conditions for ICT integration in education

Infrastructure is one of the crucial variables to integrate ICT into education. Akbulut, Odabaşı and Kuzu (2011) claim that strong infrastructure should be ensured in addition to providing equal access for all, taking precautions to facilitate ease of use and employing technical staff to help users. The development of ICT integration infrastructure is understood to be one of the domains to integrate ICT into education.

In the context with the ICT courses in teacher education, pre-service teachers are trained with Computer I and II, Instructional Technology and Material Development (ITMD) courses in Turkey. It is understood from the objectives of Computer I and II courses that pre-service teachers are expected to be literate in technology (HEC, 2006). Pre-service teachers are

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required to acquire the competency to use the existing technology in teaching-learning process through the ITMD course (Gündüz & Odabaşı, 2004).

Factors related to ICT integration (as perceived by pre-service teachers)

The pre-service teachers' perceptions regarding ICT integration are examined in terms of staff issue and teacher related variables. According to Pelgrum (2001), insufficient supervision staff, and lack of technical assistance are among the most common obstacles for ICT implementation. Therefore, the pre-service teachers' views concerning staff issue in respect to ICT integration are examined in this study. As a result of the literature review, it appears that teacher related variables are also important predictors for technology integration. According to Becker (2000), teachers' limited skill and expertise in using computers is an obstacle for more teachers to utilize computers frequently with their students. Besides, teachers' attitude to technology affects computer supported education to a large extent (Celik & Yesilyurt, 2013). According to Pamuk and Peker (2009), computer anxiety will also prevent those teachers who suffer from computer anxiety from using educational technology effectively. Moreover, Aslan and Zhu (2014) found out that pre-service teachers' pedagogical knowledge, their gains from ICT related courses in their teaching program and their perceived ICT competence significantly predict their ICT integration into teaching practice. In addition, more experience also brings about a more positive attitude towards computers (Beckers & Schmidt, 2003). Therefore, teacher related variables concerning ICT integration in education were investigated further in this study.

The association between pre-service teachers' perceptions of ICT integration and their teaching practices (as perceived by pre-service teachers)

In many studies (Teo, 2009; Yücel, Acun, Tarman & Mete, 2010; Aslan & Zhu, 2014), teachers' perceptions for ICT integration such as their ICT self-efficacy, technology attitudes, computer anxieties etc. are investigated to predict to what extent teachers integrate ICT into their teaching practices. In this study, the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices was investigated. The rationale behind this idea was to see the link between their perceptions and practices for ICT integration in education. The link is believed to give an important insight to understand pre-service teachers' ICT integration on their teaching practices holistically.

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Objectives of the study

The objectives of this study are to understand Turkish pre-service teachers' perceptions concerning the conditions for the infrastructure for ICT integration and the integration of ICT courses in teacher education, their perceptions for ICT integration, their views with regard to the effective integration of ICT in education and the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their teaching practices.

METHOD

A qualitative method was used in this study to investigate pre-service teachers' perceptions of ICT integration in education in Turkey. A total of 782 pre-service teachers answered a survey with open ended questions and 15 pre-service teachers were interviewed.

Participants

A stratified two-stage probability sampling design was used. Firstly, three Turkish state universities with the highest and lowest number of the pre-service teachers were chosen. Secondly, pre-service teachers from the subject domains of Turkish language, social sciences, elementary education mathematics and science were selected. Student Selection and Placement Center's 2012 quota was taken into account to determine the population size (ÖSYM, 2012).

The qualitative study consists of the two sections. The first section composes of the open ended questions in a survey involving 782 pre-service teachers studying in Turkish teaching, Social Sciences teaching, Science teaching and elementary education mathematics teaching in their fourth year level of education at Aksaray, Gazi, Marmara, Dokuz Eylül, Niğde and Fırat Universities in the spring semester in 2014 in Turkey. The second part involves interviews with 15 pre-service teachers (nine female and six male) in the same period in Turkey.

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Procedure

A questionnaire with open ended questions was sent to 782 pre-service teachers at six different universities in four different subjects in the spring semester in Turkey in 2014 to investigate their perceived ICT competences and their integration of ICT into teaching practices. Informed consent was obtained from all the universities and participants to conduct the study. The questions included the following elements: the pre-service teachers' perceptions of conditions for ICT integration, integration of ICT courses in teacher educations, and their perceptions regarding ICT integration into education.

Interviews were conducted with 15 pre-service teachers studying in Turkish teaching, Social Sciences teaching, Science teaching and elementary education mathematics teaching in their fourth year level of education at Aksaray, Niğde and Dokuz Eylül Universities. The interview questions were semi-structured. The interview questions aimed to understand pre-service teachers' thoughts regarding the link between their perceptions and their teaching practices.

Coding and analysis

Qualitative data analysis was used to analyze the responses given to the open ended questions and the interviews. Thematic coding was used to analyze the data. The unit of analysis was based on units of meaning. Open coding was used to ascertain the themes and axial coding was applied to connect the sub-themes under the related themes. Three major themes emerged from open coding, namely "conditions for ICT integration in education", "pre-service teachers' perceptions of ICT integration", and "the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices".

DISCUSSION AND CONCLUSION

As a result of the qualitative data analysis for the pre-service teachers' perceptions with regard to ICT integration into education, three major themes emerged from open coding, namely "conditions for ICT integration in education", "pre-service teachers' perceptions of ICT integration", and "the perceived impact of pre-service teachers' perceptions concerning ICT integration in education on their practices".

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The findings of this study indicate that classroom sizes should be small for pre-service teachers to acquire ICT skills and use it in education. Besides, the physical conditions of classrooms and buildings such as audio and visual aspects should be enhanced for ICT integration. In this context, power failures could be prevented. It is understood that there are differences among the universities in terms of ICT infrastructure. While some participants can have access to ICT sources at their universities without encountering any problem, the others have difficulty in accessing to the sources. Infrastructure policies and programs should deal with inequities in the distribution of ICT sources (Kozma, 2008). The differences among the universities can be overcome by increasing the quantity and quality of the hardware, software and ICT labs at the universities. According to Kay (2006), it is critical to provide software, hardware and support. But other strategies are needed to use technology in a meaningful and effective manner. Therefore, it should be ensured that every pre-service teacher should have access to the ICT sources without any difficulty.

The findings of this study suggest that some changes for ICT courses including increasing the course hours, extending the courses throughout the program and integration of the content knowledge into the courses should be made. While more participants perceived Computer I and II courses insufficient, more participants perceived "Instructional technologies and material development" course (ITMD) sufficient. These results show parallelism with the study by Aslan and Zhu (2014). The authors found out that the ICT courses were moderately effective. In this context, the participants made some suggestions for the effective integration of the ICT courses in education. For Computer I and II courses, participants demanded that the courses should be given in more detail and more practice should be applied in the courses. With regard to ITMD, participants suggested that the course should be provided in a more detailed way; more practice should be ensured in the course, more emphasis should be allocated to instructional technologies rather than material development and smart board should be used in education. Akbulut, Odabaşı and Kuzu (2011) found out that teacher training programs were insufficient to facilitate the effective integration of ICT and use of ICTs for instructional purposes. In this regard, Bozdoğan and Özen (2014) report that pre-service teachers should observe best practices of technology use and make practices with technology to facilitate learning, and have hands-on experiences with technology in their pre-service teacher education. It is inferred from the explanations that pre-service teachers should be given more opportunities to use ICT in their courses to be a competent user in ICT integration in education.

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Another finding of this study is related to the available personnel. Participants stated that academic members should be more competent to integrate ICT into their teaching practices. This issue is very important in the sense that their competency in ICT influences their designing, planning and teaching their courses. For instance, it is understood from the participants' responses in the context with ITMD course that less competent academic members in ICT focus on more material development rather than instructional technologies. This is confirmed by Yücel et al. (2010). The authors point out that ICT training should be given by trainers who are competent in teaching technology and curriculum needs. Besides, participants demanded that technical support should be available when they need it.

The study indicates that the participants perceive ICT important in their teaching processes. In this regard, they have a positive attitude to the integration of ICT into education. So, it is significant for pre-service teachers to have positive attitude to ICT. The study also shows that prior experience concerning ICT use has a positive contribution on their integration of ICT in education.

It also appears that participants encounter barriers in integrating ICT due to lack of experience and lack of ICT skills. If the barriers stemming from lack of experience and ICT skills are minimized, they can use ICT in their teaching practices more often.

Our study shows that some participants are anxious for ICT usage because of difficulty in learning ICT, process of preparing lesson, taking time, communication problem among students, using constantly causes monotony, teachers' being of the second importance, giving more importance to ICT, and misusing ICT. A number of teachers suffer from computer anxiety and this will prevent those teachers from using educational technologies effectively (Pamuk & Peker, 2009). In this regard, it is crucial for the participants to overcome their anxiety for ICT use. It can be suggested that more practice and experience with a variety of ICT sources in using ICT in teaching will reduce their anxiety for ICT use in education.

It indicates that participants learn ICT skills and knowledge because of work oriented, liking, and obligation. More participants perceive that their roles will decrease thorough ICT. However, participants are neutral whether ICT will increase their responsibilities in teaching with ICT.

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Majority of the participants perceive that just having ICT competence is not adequate for ICT integration and pedagogical knowledge. They stated that pedagogical knowledge in addition to having ICT competence is necessary for the integration of ICT into education. Whereas some participants perceive as ICT competence and pedagogical knowledge complementary, others perceive pedagogical knowledge as a prerequisite. It is understood that pedagogical knowledge is a crucial component for ICT integration. According to Koehler, Mishra and Yahya (2007), technology cannot be thought of being separate and unrelated from teaching tasks and contexts. They support the complex interplay between technology, content and pedagogy.

The study shows that the participants use ICT with a basic level. They mostly use it for presentation in their teaching practices. Teachers use ICT with a basic or entry level (Açıkalın, 2014; Aslan & Zhu, 2014; Tezci, 2009). Teachers should use advanced ICT skills in their teaching practices and this will enhance teaching and learning process significantly.

In conclusion, there are differences among the universities in terms of ICT integration sources. While some universities have more ICT integration sources, the others have less ones. In this regard, more investment in ICT integration sources has to be made to enable pre-service teachers to have access to the sources. The ICT courses, Computer I and II and ITMD, are the main courses in which pre-service teachers acquire ICT competences. These courses should be rearranged to make them more competent in ICT. In these courses, not only how to use technology, but also how technology can be used for teaching and learning should be focused on (Tondeur et al., 2011). In this regard, the courses should be revised considering pedagogical knowledge and content knowledge. The participants should be given more opportunity to use ICT in their teaching practices. It can be suggested that the hours of ICT courses be increased and ICT training be extended throughout the program. This can reduce their anxiety for ICT use and increase their tendency to use it in their teaching practices.

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Problem-Solving Skills In Tvet: Current Practices Among Culinary Arts Instructors In Community Colleges In Malaysia

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Abstract
Culinary Arts is one area in Technical Vocational Education and Training (TVET) where students need to possess real-world problem-solving skills besides fundamental subject matter knowledge, techniques and hands-on skills for cooking in order to survive in the industry. Problem solving skill is highly sought after by employers but past studies have shown that TVET students lack problem solving skills. The aim of this study is to identify the current practice in teaching problem solving and instructors' views towards teaching problem-solving in the delivery of Culinary Arts instruction in Malaysian community colleges. Semi-structured interviews were conducted with six culinary arts instructors and three teaching assistants at an urban community college offering the Certificate in Culinary Arts programme. The findings of this study showed that the current practices of teaching problem-solving were based on technical competencies. There was no guidance in the syllabus on how to implement problem solving for the instructors to follow. Hence, instructors focus on developing students technical skills and leave it to students to learn problem solving skills during industrial attachment, while pursuing a higher degree or at the workplace. Instead of training the future workforce to work using specific procedures, TVET education should gear to developing a thinking workforce aligned to the needs of the industry. This stresses the need to develop a module to teach real-world problem-solving skills as a support to instructors to teach problem solving to Certificate of Culinary students at Community Colleges in Malaysia.

Keywords: Problem-solving, community college, culinary, culinary arts, TVET, instructors, Malaysia

Introduction

By tradition, Technical and Vocational Education and Training (TVET) are related to teaching knowledge and skills for the world of work. TVET is defined by UNESCO as "those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic life" (UNESCO, 2014). The concept of TVET used in Malaysia is consistent with the concept of technical and vocational education used by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (Maizam Alias & Hassan, 2012). The Ministry of Education in its Malaysia Education Blueprint 2015 - 2025 (Higher Education) report outlined

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that community colleges, together with polytechnics and vocational colleges are the premier higher education TVET providers to develop talented skills to supply skilled TVET workers by the year 2020 (Ministry of Education Malaysia, 2015). Just like other Higher Education Institutions(HEIs), Malaysian community colleges are also required to integrate elements of generic skills deemed necessary to produce employable graduates as part of their curricula as required by MOE. The culinary arts industry is one important niche area in the tourism and hospitality industry in Malaysia as it plays an important role in drawing tourists to the country (Fuziah Ibrahim & Jamaluddin, 2007; Nornazira Suhairom, Aede Hatib Musta'amal, Nor Fadila Mohd Amin, & Noor Khairul Anuar Johari, 2014; Zahari, Jalis, Zulfifly, Radzi, & Othman, 2009).

Problem solving in Culinary Arts Education

Culinary Arts graduates are expected to be able to identify problems and produce creative solution at the workplace (Deutsch, 2009). Their training has to be centred on the realities of their employment (Ko & Chung, 2015; Pratten, 2003; Pratten, 2007) according to the needs and expectations of the culinary industry by the culinary instructors (Ko & Chung, 2015). Additionally, culinary instructors should possess industrial related experiences (Hertzman & Stefanelli, 2008; Idris, 2011; Lin & Cherng, 2006), should possess skill based knowledge and have in-depth subject matter knowledge (de Bruijn & Leeman, 2011). This ideal scenario ensures that students are able to be accustomed to the industry that they will be joining after they complete their studies (Brown, Thomas, & Bosselman, 2015). Culinary arts students are expected to become a trained cook especially on their first job (Ko, 2012) and should be able to gain employment in professional kitchens such as restaurants, canteens and cafes (Pratten, 2007; Steno & Friche, 2015). One of the competencies of a chef is a chef should be able to find and solve problems(Hu, 2010).

However, Malaysian employers are not convinced that community college programmes has helped students to develop aspects of thinking valued by employers (Awang, Ibrahim, Hussain, Ramli, & Lyndon, 2013). Generally, technical and vocational students in Malaysia have been reported to have lack problem solving skills (Awang et al., 2013; Bakar, 2007; DCCE, 2011; Mohamad, Heong, Hanafi, Kiong, & 2014; Rahman, Mokhtar, & Hamzah, 2011; Sander, 2012; Zaliza Hanapi, Mohd Safarin Nordin, & Khamis, 2015). For students to be able to gain problem solving skills, students must be given opportunities to solve problems. The use of ill-structured problems is generally agreed upon educators to teach problem

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solving skills. However, despite receiving instruction to inculcate generic skills such as problem-solving in their lesson by the Ministry of Education, instructors at Higher Learning Institutions are in a dilemma to inculcate generic skills since there is no standardized means of implementation or assessment of employability skills in their teaching and learning (Chan, 2011; Parmjit Singh, Roslind Xaviour Thambusamy, & Ramly, 2014). Similarly, at community colleges, instructors place more emphasis on developing students' psychomotor performances instead of developing a thinking workforce which hinders the development of problem solving skills that employers require.

Purpose

The objective of this preliminary study was to investigate the current state of teaching problem-solving among Culinary Arts instructors in the delivery of culinary arts instruction in Malaysian community colleges. Based on the objective above, the research question of this preliminary study are:

i. What are the current practices in teaching problem solving in Community Colleges Culinary Arts courses?

ii. What are the instructors' views towards teaching problem solving in Community Colleges Culinary Arts courses?

Participants

Six culinary instructors and three novice teaching assistants teaching Certificate level Culinary Arts programme at an urban community college were interviewed. The three instructors: Kamarul, Zafran and Ruby (not actual names) and their respective teaching assistants: Zuli, Ahmad and Nora (not actual names) were teaching the Certificate for Culinary Arts programme whereas Lily, Lin and Farhan are currently teaching the newly introduced Basic Culinary Certificate (Special Needs) programme. All participants were interviewed face-to-face once.

Data Collection Techniques

Semi-structured interviews using interview protocols, classroom observation using checklists and analysis of documents such as syllabus were used for data collection. The

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different methods of data collection were used for triangulation purposes. The semi-structured interviews lasted between twenty minutes to one hour. The interview protocol was prepared beforehand and focused on the current teaching practices of problem solving and instructors' views towards teaching problem solving. The Certificate in Culinary Arts syllabus was analysed to look out for elements of problem solving in the curriculum content. Interview data were saved as mp3 files and inserted into Atlas.ti software to be coded and categorized into themes. Culinary kitchen classroom observations took place during Kamarul, Zafran and Ruby's class time. The observations were recorded as field notes and were audio recorded as well so that they could be coded and categorized into themes.

Findings

Data were organized into two themes, the current teaching practices of problem solving and instructor's views towards teaching problem solving at Community Colleges. The findings indicate that despite knowing that students' lack problem solving skills, instructors focus more on cooking techniques and hands-on skills based on the syllabus. Instructors are also leaving it to students to learn problem solving skills during industrial attachment or at the workplace despite acknowledging the importance of problem solving skills for culinary students. When the module was analysed, one of the program learning outcomes outlined were, "students should be able to solve problems creatively and innovatively". However, there was no guidance on how to implement problem solving for the instructors to follow. The findings do indicate that instructors need proper guidelines to enable them to teach problem solving skills to Culinary Arts students at Community Colleges.

Current practices of teaching problem solving

Instructors highlighted that the syllabus focuses on the teaching of technical skills. They feel that problem solving skills are not explicitly stated in the current module. Hence, problem solving skills are taught based on technical skills.

Our module is more on the technical side… Problem solving is not there… maybe at the end… it takes time to include it… Problem solving has to be pulled from technical (Ruby)

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a) Rule-using/induction

Two instructors, Lin and Farhan used the rule-using problem type to teach problem solving by proving examples and non-examples. This is done so that students can differentiate between the correct and wrong techniques.

When I teach food service, I show the demo first, ask them to do it. Later, I show videos so that they can differentiate between the correct and wrong methods (Farhan)

Similarly, Kamarul, who has worked in the industry for six years prior to joining the community college, shares the technique of "chef percentages" in recipes which allow students to be able to produce their food product if they do not have sufficient amount of ingredients.

During classroom observations, instructors were found to use the rule-using approach extensively as they constantly reminded students to use the utensils and operate equipment in the kitchen properly. Rule-using was also used when students were constantly reminded of kitchen safety, hygiene and sanitation.

b) Design

Nora, Lin and Ruby teach students to substitute ingredients with other ingredients when they do not have enough ingredients or when some ingredients are unavailable.

In class, were can teach them to substitute. Sometimes, the ingredients ordered are not here yet, or we don't have it… so, they need to think, which ingredient can be used to produce the product. For example, they need sugar... so, they can substitute it with honey or glucose... Then, they will learn that different ingredients may produce different results... so, at least they will know how each ingredient (that has been substituted) influences the product (Ruby

Four instructors, Farhan, Kamarul, Lin and Ruby feel that students benefit from attending competitions as they get exposed to real-world problem solving skills during competitions when there are many ways of producing an end product.

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c) Strategic performance

When students enter competitions, they are required to perform under a few constraints such as resources and time fall under the strategic performance problem. Besides entering competitions, two instructors, Lily and Kamarul highlighted that students need to be involved in handling functions so that they will gain real-world problem solving skills. Lily and Kamarul also stressed that problem solving can be learnt when students participate in real catering functions outside of classroom.

Our students have to go out more, not just stay inside the class… in class, we learn according to the module. When we link with the industry, if they have banquet functions, our students can participate, and they will know what it is like outside…(*Lily*)

However, Kamarul highlighted that the challenge is not only in getting these outside offers, but to gain support from administrators which may perceive it as a waste of energy and time.

…chances like that are hard to come by nowadays and it requires the support from the administrators that may perceive it is as a waste of energy and time (Kamarul).

Hence, problem-solving skills in Culinary Arts have been taught while teaching students' technical skills based on technical competencies. The three problem types that have been identified were rule-using/induction, design and strategic performance. Instructors point out that problem-solving skills does not only take place during classroom time, but are also taught outside classroom time, especially when they coach students to prepare for competitions or handle outdoor banquets.

Instructors' views towards teaching problem solving

Instructors are aware that Culinary Arts student's lack problem solving skills, however, there seems to be no fixed opinion on the need to teach problem solving skills among Culinary Instructors. Some feel there is a need to teach problem solving skills and some do not.

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a) Students lack problem solving skills

Kamarul, Zuli, Lily, Nora felt that the students lack problem solving skills. They provided evidence that students lacked problem solving skills. Lily highlighted that students who have been prepared for competitions may not know how to react to non-routine situations when the question gets tweaked.

When preparing for a competition, they will only focus on the way we have shown them, if they are given a different task, when (the questions are) tweaked a little bit, they can't do it" (Lily)

In a class of 30, there may be only eight has problem solving skills. Sometimes, in an intake, only two are good… sometimes none…

Zuli brought up the issue that students in their final semester lack problem solving skills and provided evidence.

Just today, I told them to make a cold drink… They mixed the drink using hot water and added ice directly, the ice melted, and then they kept adding more ice to the drink… (Zuli)

b) Problem solving skills need to be taught

Two instructors highlighted that students need to be taught how to solve non-routine situations. Kamarul brought up the issue where he recalled a conversation he had with a renowned chef. The chef felt that students from community college need to be taught real-world problem solving skills in the college itself as they do not know how to react to non-routine situations.

Chef Steve (not actual name) *told me, "Kamarul, your students have no critical thinking skills" .I said, chef critical thinking skills… like (those required by) Degree… Diploma students? He replied, no, not that high levelled problem solving skills… For example, you have just made some sauce. While bringing the sauce from Workstation A to Workstation B, the sauce spills. Your students just do not know what to do when that happens, should they*

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take a mop or should they remake the sauce? They just stare blankly… This is (an example) of your community college students… You need to teach them how to solve problems. Chef Zubir mentioned that problem solving skill is especially important in the kitchen (Kamarul)

c) No need to teach problem solving skills at the moment

Two very senior instructors, Lily and Zafran admit that students have not been taught to solve problems. They emphasised that students need to possess cooking skills since they are only studying at the certificate level. Lily doubts that culinary curriculum elsewhere may not be emphasising on problem solving as well. Zafran on the other hand points out that it is easier to focus on providing them with the technical skills.

Our graduates have the (cooking) skills, our students have no problem with (cooking) skills, if industry says our students do not have problem solving skills, yes, our students are not trained to solve problems (Lily)

It is not that I don't want to… it is just that… it would be funny…, it is not that I am looking down upon them, I have done it… something which takes two hours becomes like…you understand… it is their level lah… That's why we should be giving them more of this (while points to the students working in the kitchen)…because, they can do it (Zafran)

Lily, Zafran and Zuli feel that students can learn problem solving skills at a later point of time. They pointed out that students can learn problem solving skills when they undergo their industrial attachment, at the workplace or when they pursue their studies at a higher level.

Once they start working, they will gain the experience and slowly work their way to the top (Lily)

That's why we have industrial training for, to show them the realities of the course that they are taking (Zuli)

If they have the passion, let them continue to Diploma level… they are here for a certificate… let's not complicate things by giving them thick assignments (Zafran)

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Hence, it is evident that students lack problem solving skills but are not being taught problem solving skills as there is more emphasis on teaching hands-on technical skills which instructors deem are more important for students to master. Figure 1 shows the summary of the themes that arose from instructors' opinion of problem solving skills teaching practices based on the current problem solving teaching practices and instructors' views towards teaching problem solving for Culinary Arts at Community Colleges.

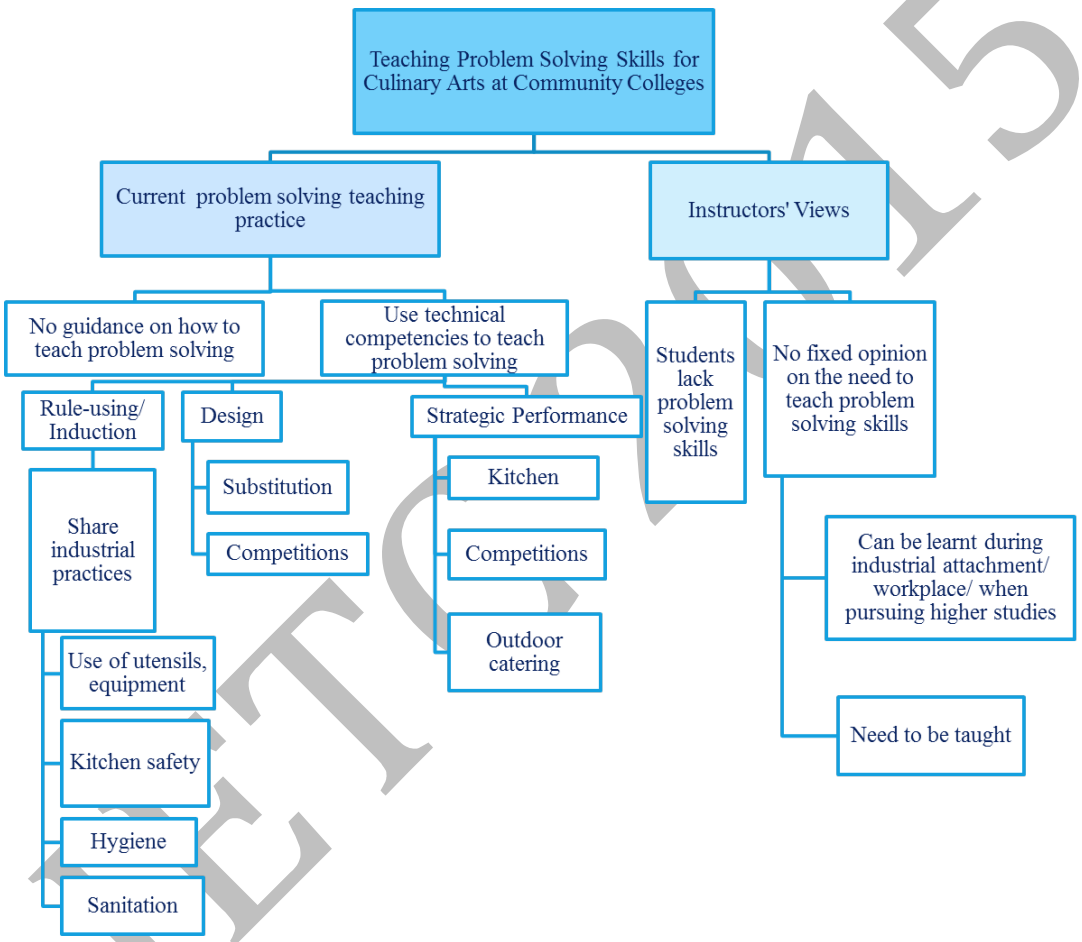


Figure 1: Summary of themes that arose from instructors' opinion of problem solving skills teaching practices

Discussion

This preliminary study has provided some insights into the current practices of teaching problem solving and instructors' views towards the teaching of problem solving for Culinary Arts at Community Colleges. It can be said that despite the syllabus has outlined generic skills as per required by the Ministry of Education(MOE) and Malaysian Qualifications Agency (MQA), instructors still do not have a standardised guideline to teach generic skills such as

problem solving. This findings complements studies on generic skills in Malaysia which have highlighted that without a standardized means of implementation or assessment of employability skills, institutions are in a dilemma to inculcate generic skills in their teaching and learning (Chan, 2011; Parmjit Singh et al., 2014). It can be said that instructors' lack pedagogical knowledge on how to teach problem solving for culinary arts as they lack proper guidelines in their syllabus to teach problem solving. Without a proper guideline to teach problem solving, instructors tend to teach problem solving as they teach technical skills that are linked with the technical competencies outlined in the module.

This present study found that instructors have been employing a variety of problem types when teaching problem solving linked with technical skills. The problem types that they pointed out were similar to the problem types outlined by (Jonassen, 2000, 2011) such as rule-using/induction, design and strategic performance. Rule-using/induction problem type can be observed when instructors teach students how to use equipment and utensils correctly and share industrial practices. Among the shared industrial practices are 'chef measurement' and ratio of ingredients to come up with end products. Other than that, instructors share industrial practices such as cleanliness, hygiene and sanitation. However, instructors are not determining the appropriate problem solving skills that can be taught based on the syllabus and are teaching problem solving skills based on their industrial experience. In the culinary arts, it is better for instructors to have industrial related experiences to the subject that they are teaching (Brown et al., 2015; Hertzman & Stefanelli, 2008; Lin & Cherng, 2006). However, due to the inconsistency of industrial experience of culinary arts instructors, there is a varied quality of instruction as instructors with more industrial experience shared industrial practices to their students. Instructors used the design type problems when they asked students to find substitutes to unavailable items to produce a product. Another type of problem which was used extensively by instructors were the strategic-performance problem solving approach as students had to complete real-time tasks under time constraints under different situations, in the kitchen, at competitions or at outside catering functions. In the kitchen, competitions or outside catering functions, the design type of problems were used together with strategic-performance problems. According to (Jonassen, 2011), both design-type and strategic-performance problems were used for ill-structured problems which were complex and real-time. However, these teaching strategies that the instructors employed did not develop students' thinking skills as they were implemented without proper guidance.

With regards to instructors' views towards teaching problem solving, the findings indicate that instructors were aware that their students lacked problem solving skills. This was evident

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especially when students faced problems transferring what they have learnt to non-routine situations or situations that they are not familiar with. This is in line with the claim of local studies that have shown that community college students lack problem solving skills and were not innovative (Awang et al., 2013). Furthermore, community college culinary students have been also reported not being able to solve related problems (Reezlin, Ishak, Zahari, & Inoormaziah, 2012). Instructors agreed that students were not being taught to solve problems. The vital inference that can be made is that instructors are not teaching the required problem solving skills despite realising that students' lacked problem solving skills.

In addition, there were no fixed opinions by the instructors on the need to teach problem solving. One instructor highlighted that employers are looking out for problem solving skills among Culinary Arts graduates and highlighted the severity of the lack of problem solving skills that Culinary Arts graduates are facing at the industry. Hence, instructors should be teaching real-world problem solving skills so that students will be prepared for the industry (Billett, 1996; Herrington & Oliver, 1995; Herrington, Reeves, & Oliver, 2014; Jonassen, 2013; Kirschner & Van Merriënboer, 2008; Lave & Wenger, 1991; Merrill, 2002; Merrill, 2012; Pratten, 2003; Pratten, 2007; Savery & Duffy, 1995). However, what is worrying is some Community College instructors still perceive that problem solving which is a requirement by the authorities is deemed not that important to be taught at the Certificate level. This is because instructors feel that students are not mature enough to get involved in the process of thinking skills as they are only in their Certificate level. When will they be ready, if not now? This negative point of view from instructors has resulted in a situation where instructors leave it to the students to learn problem solving skills while students undergo their industrial attachments at the end of their studies, at their future workplace or only when students continue their studies to a higher level. On the other hand, instructors pay more attention to the teaching of technical skills to their students which they feel is sufficient to survive in the industry. This is because instructors have always assumed that mastery of technical skills within the area of specialisation is more highly regarded by future employers (Robinson & Garton, 2008). Hence, instructors are hesitant to move away from current teaching practices to teach problem-solving based approaches (Brown, 1998).

Conclusion

The findings of this small-scaled preliminary study has provided some insights into instructors' current teaching practices of problem solving in Culinary Art courses in

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Community Colleges in Malaysia. Even though the findings may be relevant to the context of the study, this study has highlighted the views of culinary instructors at Community Colleges towards teaching generic skills such as problem solving skills which are highly sought after by employers. Sadly, some instructors still perceive that problem solving skills can be learnt later and focus more on developing students' technical skills instead. A reason for this scenario is instructors lack proper guidance on embedding real-world problem-solving skills in the curriculum for example how to use the existing learning objectives to teach problem solving skills. Since industrial experience among culinary arts instructors are varied, there are inconsistencies in how problem solving skills are being taught. Nevertheless, problem solving skills that are highly sought after by employers is best trained as early as possible so that culinary students can internalize the process earlier (Brown, 2006). Moreover, real-world problem solving skills if implemented well can encourage students to be more passionate about the topic (McIntosh, Jarrett, & Peixotto, 2000). Instead of solely depending on instructors for input, more student-centred approaches, which focus on applying theory in practical and authentic settings for learning and technical skills, have been recommended based on the rise of attention towards the inculcation of generic skills among students (Carvalho, 2015; Ko, 2012). Instead of training the future workforce to work using specific procedures, TVET education should gear to developing a thinking workforce aligned to the needs of the industry. Future studies can focus on developing a module that can be used as a guideline to teach real-world problem solving for Culinary Arts students at Community Colleges in Malaysia.

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Research And Trends In The Studies Of Homeschooling Practices: A Review On Selected Journals

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Abstract

The practice of homeschooling still receives contrasting responses on its relevancy and effectiveness. The current study is aimed to map the trends in the selected eleven studies from various educational journals. The analysis focuses on mapping the trends on: a) research settings, b) target sample, c) method or instrument used, d) common focus or issues covered, and e) pattern in the findings of all selected studies. It is found that majority of the current studies were more focusing in evaluating the effectiveness and relevancy of homeschooling as an alternative to traditional schooling, especially on the area of effective learning experiences and healthy social development. Despite the strengths of homeschooling practice, this paper has also discovered the discrepancies in the findings of the current studies and provided recommendations for an effective homeschooling practice.

Keywords: homeschooling, home education, teaching and learning, curriculum.

INTRODUCTION

Crucial to academic success, homeschooling has become a growing education phenomenon across the globe. It appears that, in the teaching and learning of homeschooling, the academic inputs and outcomes are 'tangible' for parents in tailoring their children's needs in learning. A structured homeschooling has proven to be effective in improving academic success (Cogan, 2010; Harding, 2013; Rudner, 1999). However, many researchers argued the basis of this claim. The current body of literature seems to suffer from poor empirical knowledge base and evidences in justifying the effectiveness of homeschooling. Murphy (2014) summarizes that studies on overall impacts of homeschooling are still lacking.

To further investigate the above argument, the current paper explored 11 recent studies (from 2011 to 2014) in understanding and mapping the trends and patterns of the selected studies.

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RESEARCH PURPOSE

It is hoped that current paper would enlighten readers on the trends of the research and their findings in justifying the effectiveness of homeschooling in improving academic performance. Eleven recent articles published in 2011 to 2014 were selected from the Web Of Science under the keywords of 'homeschooling', 'home school' and 'home education'. Only the studies that investigate the practice of homeschooling were selected for the analysis. It is our attention to provide an analysis of the selected studies as it is believed to serve as a relevant reference to understand the homeschooling practices.

In doing so, this study explored the research questions below:

1. Which research setting had high frequency in the selected studies?
2. What was the frequent target sample used in the selected studies?
3. What was the frequent method/instrument used in the selected studies?
4. What was the current focus or issue explored in the selected studies?
5. What was the pattern of the findings in the selected studies?

METHOD

The selected articles were retrieved from the Web Of Science, and were from various educational journals published in 2011 to 2014. The articles were from a) Journal of Adolescence, b) Sociological Spectrum, c) Procedia-Social and Behavioural Sciences, d) Transactions of the Institute of British Geographers, e) Gifted Child Quarterly, f) Journal of Black Studies, g) Education and Urban Society, h) Focus on Autism and Other Developmental Disabilities, i) European Journal of Education, and j) Education As Change.

In finding the trends, all selected articles were cross analyzed to their journal details, research objectives**,** participants, data collection and analysis method, research findings, and focus or issues discovered. The variables, such as participants and settings, research design, and research focus were further analyzed statistically in mapping the trends of the current studies. In addition, a content analysis was conducted in exploring the common issues and patterns of findings by analyzing the research questions and focus of the selected studies. The frequency and percentage counts were used to visually represent and describe the trend and patterns of the selected current studies. Table 1 below summarizes the analysis of variables of

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all studies according to selected participants, research design, data collection method, data analysis, research setting, findings and focus or issue explored.

Table 1: Content analysis of selected eleven articles.

Study (Author/Year)	Participants	Data Collection	Data Analysis	Research Findings	Focus/Issues Discussed
Green-Hennessy, S. (2014).	182 351, 12 to 17 year-old adolescents from the National Survey and Drug Use and Health (NSDUH) participants in the United States.	Interviews and the Nicotine Dependence Syndrome Scale test.	Interview analysis based on: a) demographic and religion, b) delinquencies, c)substance misuse and prevention service, and d)schooling.	Religious homeschoolers and public schoolers were less likely to involve in juvenile delinquency. Homeschoolers are more likely to fall behind expected grade.	Comparing traditional-schooled and homeschooled adolescents with either lower or stronger religious in their achievements in academic, extracurricular participation and the misuse of substance and delinquencies.
Vigilant, L. G., Anderson, T. C., & Trefethren, L. W. (2014).	21 Euro-American, Christian males (fathers) in the upper midwestern states of North Dakota and Minnesota.	In-depth, face-to-face interviews (using structured questionnaire intstrument) and ethnographic observations.	Interview analysis based on the role of the father in homeschooling environment.	The roles of the father in homeschooling include: being a 'helpmate' and 'spiritual leader', manager of interpersonal emotion and disciplinarian.	Analysing the role of father in homeschooling settings.
Korkmaz, H., & Duman, G. (2014).	130 respondents in a metropolitan area in Turkey.	Survey.	Analysis based on five domains: a) demographic characteristics, b) religious reason, c) lack of trust in public education, d) control over curriculum, and e) types of education and financial support.	Homeschooling can develop better character and morality, and provide supportive learning settings.	Exploring the public understanding of homeschooling.
Kraftl, P. (2013).	30 homeschooling families in United Kingdom.	Interviews and observational visits.	The analysis of the interviews covered: a) life-history structure, b)spaces of learning,	Meaningful learning happens on the move and in everyday spaces.	Exploring the homeschooling practices and to map the 'geographies' of space, motivation and

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			c)interactions between learning and everyday life, and d)ambitions held for homeschooling.		experiences of homeschooling.
Jolly, J. L., Matthews, M. S., & Nester, J. (2012).	13 parents from four different regions of the United States.	Homeschooled gifted children survey (initially conducted in 2009), and interviews.	The analysis of the interviews covered: a) children's abilities, b) experiences with public school, c)perceptions of challenges.	The sense of 'order and empowerment' is the main reason for homeschooling.	Exploring the parents' perspectives to homeshool their gifted children.
Mazama, A., & Lundy, G. (2012).	74 Black homeschooling parents from Mid- and South Atlantic and the Midwest.	Interviews (semi-structured and open-ended), survey (demographic background) and observations.	The analysis of data covered: a)demographic background – ethnicity, origin, children characteristics and education level of parents. b)reasons for homeschooling,	Racism interfered and affected their children's learning in normal school.	Unveiling the issue of racism as one of the main reason to homeschooling.
Hanna, L. G. (2012).	250 homeschooling families from urban, suburban and rural areas within the Commonwealth of Pennsylvania.	Interviews (open-ended questions on the phone and computer), questionnaire.	The analysis of data explored: a) demographic information of instructors and children, b) methods, materials and curriculum used, and c) motivation.	Parents from different areas have different philosophy and practice of teaching.	Exploring the trends of homeschooling practices by critically considering the types of methods, materials and curricula used by parents.
Hurlbutt, K. S. (2011).	Ten parents from nine families who homeschool their ASD children in Mid-Western U.S.	Interviews with parents.	The data were analyzed using open-coding procedure that covers: a) parental responsibilities and education, b) conflicts with school, and c) monitoring, and curriculum.	Parents who chose homeschooling viewed their commitment as mutual decision in providing effective learning settings to their ASD children.	Exploring parents' perceptions and experiences of homeschooling ASD children.
Ice, C. L., & Hoover-Dempsey, K. V. (2011).	64 parent-child dyads (30 public and 34 homescooler parents) in the	Questionnaire on parent involvement and parent's motivation for	The data were analyzed by correlations and hierarchical	Homeschooling parents have stronger efficacy, role activity beliefs	Focusing on comparing the parents' motivations in homeschooling

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	U.S.	involvement.	regressions analysis.	and social network beliefs in teaching their children.	and public schools.
Blok, H., & Karsten, S. (2011).	14 European countries (excluding Eastern and Southern Europe).	Self-reporting, home-visits and contacts with parents or children.	Compiling the national cases and fabricated and compared case-descriptions.	The general function of inspection is to accommodate children's learning environment and to monitor their progress.	Investigating the home-education inspection practices in European countries.
van Schalkwyk, L., & Bouwer, C. (2011).	Four homeschooling families (two Afrikaans-speaking, one English-speaking and one Asian family) in South Africa.	Case study method, which includes unstructured interviews, reflective interviews, field notes and reflective journals.	The data were analyzed using verbatim transcriptions and discourse analysis.	In a unique case, homeschooling practice was more oriented to the mother's discourse and goals.	Exploring the homeschooling practices from different angles: parents and children.

RESULT AND DISCUSSION

Research settings

Out of 11 studies, most studies were conducted in United States of America (63.64%). Other countries share the same frequency (1) and percentage (9.09%), as represented in Table 2.

Table 2: Summary of research settings of selected eleven articles.

Research setting	Frequency	Percentage
United States	7	63.64
Turkey	1	9.09
United Kingdom	1	9.09
European countries	1	9.09
South Africa	1	9.09

The development of homeschooling in United States of America started since 17th to 18th century as an alternative to cater the needs of children's learning and religious practices (Ray, 2002; Wilhelm & Firmin, 2009). It is undeniable that homeschooling in U.S. has undergone numerous changes in its structure and visions. The diversity of ethnicities and cultures in U.S. has shaped homeschooling education as one of the medium to unite and strengthen the bond through education, under the Compulsory Attendance Law 1918 (Bellini, 2005). With the rapid changes in homeschooling practices in U.S, ongoing dilemmas and concerns have

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shaped the possible forms of the homeschooling practices in the recent years. For instance, Mazama and Landy's (2012) study has explored the issue of racism that occurred in public school and how homeschooling is viewed as an alternative to restore children's self-confidence and healthy learning environment. On the other hand, Green-Hennesy (2014) and Vigiliant, Anderson and Trefethren (2014) have explored the religious practices of homeschooling and its contribution to academic success. The depth of the literature in the U.S. has provided a clearer developmental phase of homeschooling, which started from a medium of unity and Christianity to academic achievements from different angles.

On the other hand, the other studies focus on gathering an overall overview of homeschooling practices at national level. Kraftl's (2013) study focuses on mapping the geographies of homeschooling in United Kingdom by generally investigating the space of learning at national level. Similarly, Blok and Karsten (2011) focuses on investigating the practices of homescholing from the inspectorate practices at international level, in almost all European countries excluding Eastern and Southern Europe. Only one study was conducted in Turkey in gathering public views of homeschooling because it was yet to be legally practiced in Turkey (Korkmaz & Duman, 2014).

Sample selection.

From selected eleven articles, the sample selections are categorized as in Table 3.

Table 3: Summary of sample selection of selected eleven articles.

Sample selection	Frequency	Percentage (%)
Homeschooling parent(s)/families	7	63.64
Homeschooling parents with special/gifted children	2	18.18
Adolescents (homeschoolers and public schoolers)	1	9.09
Parents with no homeschooling experience	1	9.09

Most researchers (63.64%) have selected homeschooling parent(s) or families as their sample. These parents and families are the agent of homeschooling practices and thus, their insights about homeschooling practices and its effectiveness are highly relevant to these studies. As defined by Korkmaz and Duman (2014), homeschooling parents play an important role in educating and structuring their children's learning at home. Lois (2013) claims that one of the role that most parents play is mother-teachers. However, out of seven articles, a study by Vigilant et al. (2014) has explored Christian fathers' role in homeschooling settings. This study has expanded the perspective of homeschooling practices, which were typically

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being associated with mothers. The fathers function as helpmate, spiritual leader, disciplinarian and manager of learning and relationship quality (Vigilant et al., 2014).

The other studies have explored the role of parents and family in different home-education settings. For instance, Hanna (2012) explored the differences of homeschooling practices in urban, suburban and rural areas. Similarly, van Schalkwyk & Bouwer (2011) explored racial and language backgrounds as the focus in describing the differences of homeschooling practices. Two studies were conducted to focus on homeschooing practices at a larger scale: homeschooling families in United Kingdom (Kraftl, 2013) and the role of homeschooling inspections in most European countries (Blok & Karsten, 2011).

On the other hand, there are two studies that focus on homeschooling parents with special (Hurlbutt, 2011) and gifted children (Jolly, Matthews & Nester, 2012). These studies have investigated the parents' decision to homeschool a and discovered the drawbacks of public schooling in catering their children's learning needs. Very differently, a study by Korkmaz and Duman (2014) focuses on parents with no homeschooling experience because this alternative education was not legally practiced in Turkey. Lastly, Green-Hennesy's (2014) study directly compared homeschooling and traditional school adolescents in their involvement with substance misuse and academic performances.

Data collection method.

Three different types of methods or instruments were used across all eleven studies, as represented in Table 4. Some of the studies combined more than one instrument.

Table 4: Summary of method/instrument used in selected eleven studies.

Method/instrument	Frequency (n/11)	Percentage (%)
Interviews	9	81.82
Survey/Questionnaire	6	54.55
Observations	5	45.45

Majority of the studies (81.82%) employed interviews as the main source of data collection, followed by survey or questionnaire (54.55%) and observations (36.36%). Most of the interviews were conducted using thematic prompts in gathering the insights of homeschooling practices (Hanna, 2012; Jolly et al., 2012; Kraftl, 2012; Mazama & Lundy, 2012).

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On the other hand, the surveys or questionnaires used in all six studies have different focus and can be categorized into five themes: a) substance misuse (Green-Hennessy, 2014), b) preliminary insights of homeschooling (Korkmaz & Duman, 2014) c) gifted and special-needs survey (Jolly et al., 2012), d) demographic and cultural background (Mazama & Lundy, 2012), and e) homeschooling practices (Hanna, 2012; Ice & Hoover-Dempsey, 2011).

Lastly, observations were conducted on both parents and children during homeschooling teaching and learning. From all four studies, there are five different focal points in the observations: a) the role of father (Vigilant, Anderson & Trefethren, 2014), b) teaching and learning spaces and materials (Kraftl, 2013), c) racial protectionism in learning settings (Mazama & Lundy, 2012), d) the role of inspections in homeschooling (Blok & Karsten, 2011), and e) parent-child homeschooling discourses and participations (van Schalkwyk & Bouwer, 2011).

Interestingly, Murphy (2014) argues that most studies in 1980's and early 2000's have contributed little empirical evidences on the effectiveness of homeschooling. Typically, the past studies only explored and described the practice of homeschooling and have overlooked its effects on children's learning and development. However, the above findings have added flesh in describing the trend of the current studies in the area of homeschooling development and practices. It is apparent that the recent studies have explored and gathered empirical-based evidences in describing homeschooling development and practices. For instance, Ice and Hoover-Dempsey (2011) have discovered the correlation between parental motivation and students' achievement in homeschooling using hierarchical regression and correlation analysis. Other studies (Green-Hennessy, 2014; Hanna, 2012; Korkmaz & Duman, 2014;) have similarly explored the relevance of homeschooling from different angles, and proposed a strong foundation of empirical evidences to support homeschooling practices.

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Focus and issue covered.

The studies in the area of homeschooling have explored various angles and perspectives in describing and justifying the relevancy of homeschooling as an alternative education. Table 5 represents the focus or issue explored in all eleven articles.

Table 5: Focus or issue covered in selected eleven studies.

Focus/Issue	Frequency	Percentage(%)
Homeschooling as an effective and healthy learning alternative.	5	45.45
Homeschooling practices.	4	36.36
Role of inspections in homeschooling settings.	1	9.09
Public views and undestanding of homeschooling.	1	9.09

Majority of these studies (45.45%) examined the homeschooling as an effective and healthy learning alternative. From all five studies, there are two studies uncovered the importance of homeschooling for gifted and special-needs children (Hurlbutt, 2011; Jolly et al., 2014). These studies illustrated that public schools are incapable to cater to their children's needs of learning. A study by Mazama and Lundy (2012) similarly noted that traditional schooling in the Mid and South Atlantic and the Midwest of America, was not a healthy environment for the children due to racism and racial prejudices. The other two studies were focusing on comparing homescooling with traditional schooling based on delinquency rate (Green-Hennesy, 2014), academic achievement and motivational level of parents (Ice & Hoover-Dempsey, 2011).

On the other hand, there are four studies explored on mapping the homeschooling practices. It is apparent that the homeschooling practices might vary geographically. The cultural background (van Schalkwyk & Bouwer, 2011), locations (Hanna, 2012) and personal beliefs (Kraftl, 2013) are among influential factor to the designated homeschooling practices. In another study, Blok and Karsten (2011) have investigated the role of inspections in homeschooling settings. This study provides a different angle on how educational inspections might help to accommodate and shape a 'standardized' homeschooling learning experiences.

Lastly, there is only one study (Korkmaz & Duman, 2014) that focuses on gathering public view on what is needed for an effective homeschooling practice in Turkey. This study has contributed in representing the 'ideal' structure and implementation to suit the localized context of homeschoolin in Turkey. In short, the above studies have contributed to the lacuna of literature by exploring the homeschooling practices in different angles and the findings might serve as a relevant point of reference to improve the current practices.

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Themes of the findings across all studies.

a) The potential of homeschooling as an effective alternative to traditional education.

The present study has indicated the trends of the current literature of homeschooling practices. Positive outcomes to support homeschooling were witnessed in the majority of the selected studies. The parental involvement in children's learning has been associated as a catalyst to success. One of the reasons of homeschooling is the inability of traditional schooling to support the learners' needs (Kraftl, 2012; Jolly, et al., 2012; Vigilant et al., 2014). There were three dimensions on how homeschooling works in improving learning; a) to provide one-to-one support to learning, b) to create a safe and healthy learning environment, and c) to provide adequate and appropriate learning supports for special-needs and gifted children. Primarily, the researchers agreed that space and learning experiences at home have fabricated meaningful learning experiences. For instance, Kraftl (2013) found that learning at home does not restrict to textbook learning and standardized curriculum. Learning happens inside and outside the house and thus, the dimension of learning in homeschooling covers academic and practical knowledge (Kraftl, 2013). Similarly, Ice and Hoover-Dempsey (2011) elucidated that homeschooling parents have stronger efficacy in designing and fabricating effective learning. This may attribute to the academic success of the children. Secondly, a safe and healthy learning environment seems to be neglected in public schooling (Mazama & Lundy, 2012). The issues such as racism and racial prejudices in the public school have affected the African-American children, even with the racial protectionism being practiced in the public schools (Mazama & Lundy, 2012). Hence, homeschooling is an alternative to provide a safer and healthy learning environment for the affected children. Also, Vigilant et al. (2014) has mapped how the role of father is important to structure and balance the learning at home. The elements of spiritual beliefs and discipline in learning have been given a strong emphasis in achieving a well-balanced education, which also agrees with Charlotte Mason's ideal learning belief (Simply Charlotte Mason.com, 2011). Lastly, the incompetency of traditional schools in catering the needs for the gifted and special-needs children has also shifted the space of learning to be conducted at home (Hurlbutt, 2011; Jolly et al., 2012). The parents believe that a sense of order and empowerment in deciding their children's learning pace and experiences has made them to de-school their children (Jolly et al., 2012) and to provide better learning opportunities for their children.

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Very differently, Green-Hennessy (2014) and van Schalkwyk and Bouwer (2011) have discovered that homeschooling practices have several drawbacks. In a larger study, it is found that, the homeschooling adolescents were reported to fall behind in academic performance and faced more social difficulties compared to traditional schoolers (Green-Hennessy, 2014). In addition, van Schalkwyk and Bouwer (2011) have appointed that the homeschooling children might face difficulties in social interactions due to the strong attachment to parental supervision. Also, they noted that many homeschoolers suffer as their development and interest have to compromise with their parents' established visions and goals. In short, there are several limitations that should be considered when conducting the home-education, especially the one concerning on the direction of homeschooling practices and its structure. Nevertheless, the previous studies have proven that structured and flexible homeschooling learning was effective to overcome the above conditions (Cogan, 2010; Harding, 2013; Rudner, 1999).

b) The considerations for an effective homeschooling practice.

The selected articles for this study have appointed considerations and recommendations for an effective homeschooling practice. Mainly, the practice should consider an ample attention to children-parents goals and learning structure. Most of the studies have highlighted the importance of establishing teaching approach to suit children's learning needs (Hanna; 2012; Hurlbutt, 2011; Ice & Hoover-Dempsey, 2011; Kraftl, 2013). Even though the practice of homeschooling is to overcome the drawbacks of traditional schooling, there are a number of cases that reflected that the incompetency of parents in conducting the homeschooling. Green-Hennessy (2014) reported that even though the ideological homeschoolers were less likely to indulge in juvenile delinquency, their academic performances were still behind compared to traditional schoolers. Also, the pedagogical homeschoolers were found to be more likely to involve in substance misuse. Green-Hennessy (2014) claims that the parents' lax attitude in inculcating awareness and preventions is the contributing factor to above condition.

In Kormaz and Duman's (2014) study, the parents addressed that limited knowledge on curricula, theoretical, and practical scientific knowledge were among the challenges in conducting homeschooling. In dealing with this concern, some parents approached this using multiple resources, such as purchased curricula and district materials in preparing the teaching and learning lessons (Hanna, 2012). The findings of Hanna's (2012) study also suggested that the use of information and communication technology (ICT) might assist learning in

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equipping them to be 21st century learners (Norlidah Alias, Mohd Nazri Abdul Rahman & Saedah Siraj, 2014).

Secondly, the support from the government is found to be helpful for homeschooling practices. Kormaz and Duman (2014) highlighted that the parents who wish to homeschool their children still require support from the government in term of materials, financial and chances to attend some classes in public school. In addition, Blok and Karsten (2011) claims that homeschooling inspections are needed to accommodate and monitor children's learning. The monitoring and mentoring by the government is relevant in maximizing the 'quality' of homeschooling learning and to avoid them to be left behind from public schooling (Blok & Karsten, 2011).

In the case of home education, the above recommendations can be considered into its implementation. The drawbacks in its practice still can be reconditioned. The flexibility of homeschooling teaching (Blok, 2004) is one of the important characteristics that can help to constantly improvise its practice. The above suggestions are derived form the current body of literature, reviewed in this paper, and are relevant to be considered in enhancing homeschooling implementation.

CONCLUSION

The overall aim of this paper was to map the trends of the current studies in the area of homeschooling development and practices, through the analysis of the research settings, sample selection, methods and instruments, focus and issue covered as well as the similarities and differences in the selected studies. Overall, it is apparent that most studies were conducted in United States of America. These studies have discovered numerous issues from effectiveness of homeschooling to racial protectionism in teaching and learning environment. It is also found that most studies were focusing on gathering insights from the parents in reviewing the practices of homeschooling. This is most resonant to the focus of the most studies, which was to evaluate the effectiveness of homeschooling in providing an effective and conducive learning setting.

Interestingly, the current studies have also tried to add flesh to literature by providing ample empirical evidences in justifying the importance of homeschooling. Previous studies, such as in 1980's and early 2000's were suffering from poor empirical-based evidences (Murphy, 2014) as they sought to only describe the practice without majorly investigating the

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effects of homeschooling practices on children's development and learning outcomes. Nevertheless, the finding of this paper has indicated the opposite. There are a number of studies that have further explored this matter from various angles, such as the effect of homeschooling on involvement in juvenile delinquency, parents' motivation and students' achievements, and homeschooling teaching practices and academic achievements.

In short, homeschooling has offered a flexible learning for children who might face difficulties in traditional schooling. Issues such as racism, special needs in learning, and incompetency of traditional learning were able to be resolved through homeschooling implementation. However, there are still areas that can be improved such as in maximizing the support material and other educational supports from the government. Also, informational and communication technology has a brighter potential to further develop a strong learning community and access to relevant materials to homeschooling learning.

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Research Of Influence Of Variant Part Of Educational Program Of An Engineering University On Students' Self-Determination Promotion

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Abstract
The analysis concerning the intention of the youth (aged 16-25) to self-determination referring to their age bracket is carried out. The conditions contributing to the early initiation of their vigorous activity are considered. The practicability and reasonability to include innovative educational services in the basic educational syllabus are demonstrated. The content of standardized variant training syllabus for engineering universities called "Social and economic adaptation of the youth to business architecture-building environment" is proposed. The distinctive feature of this syllabus is its convergence and the organization of training in the chain like way "instructor (lecturer)-student-pupil", whose chain links are in close collaboration and interaction. The importance of the business - incubator in the construction of scientific-educational and professional trajectory of the students is discussed. The outcomes of the training in accordance with this syllabus based on the business - incubator are presented.

INTRODUCTION

The understanding and comprehension of new reality in the conditions of high competitiveness at the labor market sets new aims and objectives to the education -shaping skills and habits for fast mobilization and adaptation of the personality to the changing professional and life situations. The operability (efficiency) to respond to the realities of the current situation is provided by the shaping of new style of thinking and activity (Budyakova, 2005, p.76). This new style is based on the stability of the professional plans, the confidence and purposefulness. Therefore, the vocational training and career education require more specific and well-grounded organization of valuable personal self-determination in the modern system of education (Kiryakova, 2010); the transfer from passive information perception to constructive mastering and conversion of education space (environment) and its involvement into own life activity; the establishment of person's individuality and subjectivity. There is an active development of the innovative infrastructure with interconnected organizational components allowing to change the relation between the components of teaching technology faster. There are no typical models that give a clear idea which components of the institute of higher education infrastructure are more efficient and how they influence the innovative development. The development of innovative activity is

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own in each institute of higher education, with its own innovations and complication of relation between organizational components.

It is obvious that operational student's self-determination and the construction of his own scientific-educational and professional trajectory is impossible without variant part (component) of educational program (syllabus) which allows to apply knowledge practically. The problem concerning sharing of experience related to shaping effective selection and composition of instructional content, forms and techniques, ways and methods, training tools (resources) in variant syllabus as well as in the organization of lesson conduction is vital and contributes to the optimization of educational process.

THE STUDY

This paper presents the outcomes of uniform variant part (component) of educational program (syllabus) of an engineering university called "Social and economic adaptation of the youth to business architecture-building environment". The commonality of variant syllabus is in the possibility to use it in different technical institutes.

The advantages of variant part (component) of the basic educational program (syllabus) are as follows:

- Immediacy to change / to enhance the basic program with new blocks; to intensify the blocks with materials from the basic program;
- adaptability to the students' knowledge;
- availability, since there is no need to pay for education and there are no limits of conditions for clients acceptance;
- addressness /orientation on clients, since this part is developed to satisfy the clients' needs. This contributes to personification of education;
- applied nature, since the program is developed in accordance with the needs and the arrangement of social and economic ties (contacts) with the executive government body and business in the city, region and province.

The syllabus approbation was carried out on the basis of students' business-incubator. This business –incubator plays a role of a special environment (space) created to simulate favorable conditions to shape adaptation abilities, the promotion of cognitive activity, the development of the personality (motivational and emotional and strong-willed qualities). The advantages of conditions are provided by free educational and tutorial services, the availability of resources at the initial stage of sense making activity.

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FINDINGS

The syllabus content includes range of educational services on the following four guidances not included into the educational standards of the basic program:

1. Psychological-developmental technologies. These technologies contribute to making up of personality subjectivity: shaping of his/her critical thinking (Kiryakova, 2013, p.182), the development of the personality readiness to the evaluation argumentation (reasoning). Moreover, the orientation in the social space is more independent. The valuable-meaning activity of this block of this uniform program is aimed at the development of crucial life personal values: business (entrepreneurial) competence, creative potential in accordance with the theory of innovative problem solving system, ecological behavior culture, presentation culture concerning the person ant his project.

2. Business–education. It allows to plan and carry out the business (entrepreneurial) activity in the professional field and day-to-day life (business –planning, the fundamentals of economics and entrepreneurship).

3. Cross-cultural communication (Business Foreign Language Course: Business English, Business French, Business German and etc.)

4. Media-education – shapes computer skills which include the skills to use Computer-Software for computer construction in virtual laboratories: basic course 3ds MAX; three-dimensional graphics; animation in the software 3ds MAX; the fundamentals of computer graphics for WEB; Cinema 4d.

There are different special courses for each profile. These special courses have their own educational programs with aims, objectives, content, training techniques and forms of lesson conduction. A set of didactic material was developed (teaching aid for workshop and training conduction). Thematic lessons are conducted in different forms by using different teaching methods, which allow to develop analytic and synthetic thinking of the young people under new economic conditions (Ikonnikova, 2014, p.1). Based on the special course program the customer can form a customer-oriented order on the course of study (curriculum) that satisfies customer's needs. There is a public defense of own project when the course is over.

The developed uniform variant syllabus was presented at International Conferences (2009 – Tomsk, 2010 – Moscow and St. Petersburg, 2011 Novosibirsk, 2012 – Belokurikha), All-Russian Conferences (2009- Penza, 2010 – business –camp "Seliger") and regional conferences (Tomsk, Novosibirsk) devoted to the problems of the development of youth entrepreneurship and competence approach in education, interaction and interrelation among authority, business and education.

Since 2009 this syllabus is becoming important and essential in the regional system aimed at young people involvement in the undertaking. Municipal structures (administration of Tomsk and Tomsk Oblast (Region) and federal structures (The Common House of Russian Federation) are the partners in the program implementation, and customers of this program content and outcomes. 15 treaties concerning the cooperation with different organizations of Tomsk such as the institutes of higher education, scientific-production associations, secondary vocational education, secondary education institutions were concluded. There are 15 statements drawn up showing the implementation of these teaching and methodical papers into the educational process of different educational institutions. 30 public events with training in different forms (training sessions, contests, forums, conferences, exhibitions, tournaments, informational campaigns, open days, away workshops) were held.

The educatee is not only a student of vocational educational institutions (institutes, universities – HVE (higher vocational education, primary vocational educational institutions, and secondary vocational educational institutions), but also the students of secondary schools, gymnasiums and colleges. The mentioned above comprises the distinguishing feature of this educational program. Table 1 illustrates the dynamic of the number of the students from institutions of different educational levels. 1400 people from 15 different educational institutes took this course within 6 years.

This table demonstrates that pupils (schoolchildren) show the most interest in training on this program. This fact is very significant and can be explained by the readiness of the young people to apprehend and take the current society values from their early age, since their school-days.

Table 1.- The students' dynamic from institutions with different level of education

Educational institution	Number of graduates/years					
	2009	2010	2011	2012	2013	2014
Higher vocational education	30	32	30	31	35	37
Primary and secondary vocational education	57	45	60	84	110	110
Secondary education	120	123	110	115	120	153
TOTAL	207	200	200	230	265	300

The revealed tendency has determined the invariant core of the program "Teacher - Student - Pupil" which consists of three ladder-type components unlike the program "Student" which represents only a single-link student-oriented program. Three ladder-type

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(three level) closed cycle of the Program core is the tool aimed not only at students' development but at teachers development as well.

Therefore, this Program offers favorable opportunities for pupils to satisfy their needs in self-actualization, self-fulfillment and self-expression as earlier as possible (Okon, 1968). The obtained experience in independent and free homework execution (addressed project-based learning (Makhmutov, 1975) helps the pupils' adaptation to the educational process, and allows easily to overcome the gaps between general education and deeply- specialized training (Selevko, 1998). It also helps the students at primary stages, who are in their first years at university or college to be very active in getting vocational (professional) education and take part in specialized activities (research, research and development activities and undertaking). Otherwise, the process of the competence formation (the personality potential, which in future will determine the quality of work and duties execution (Makhmutov, 1975)) will develop with great difficulties and will be unsuccessful.

The students comprise the connecting-link between the instructors (teachers) and pupils. They are responsible for pupils work coordination and consider and solve the arising problems with the specialists working at universities and other institutions of higher education. They are also responsible for execution of scientific and technical solution. There is a good experience for students concerning the organization and management of the process which forms their sense of responsibility for the work performance quality. In the course of the project execution many personal qualities such as communication skills, creativity, initiative, independence (self-dependence) are developed. The efficiency of this experience is measured and evaluated by the student's portfolio which contains his or her articles, diplomas, and certificates. Some concrete students' papers are presented in the references (Ikonnikova, 2014), to show the students' samples of portfolio documents. 15 projects from one hundred ones were awarded by diplomas of municipal, regional, national and international events.

The instructors (teachers) supervise and coordinate students' and pupils' performance at all stages of their individual project execution. They are also responsible for the issues concerning management and upbringing and support the young people to move forward following their scientific and educational trajectory. The educational guidance and accompaniment of students encourages the instructors (teachers) to get new knowledge in other fields.

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CONCLUSIONS

The reasonability and practicability of the introduction of the innovative educational services in the variant part (component) of the basic program (syllabus) of educational standards were shown. The content of the uniform variant syllabus called “Social and economic adaptation of the youth to business architecture-building environment” for engineering universities was suggested. Variant part (component) is convergent, the main parts of this syllabus are interconnected and subordinated to the components of the generic structure of the educational program. The efficient model of making up of personality based on three component closed cycle training “instructor (teacher) – student – pupil” was developed and practically implemented. The significance of the business-incubator in operational construction of scientific-educational and vocational educatee’s trajectory was analyzed. The training outcomes of this syllabus on the basis of the business-incubator were presented.

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Research Of The Amount Of Time Spent Playing Computer Games By Children At The Age Of 11 And 14

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Abstract
The article is focused on the issue of playing computer games and with the use of research data it tests the following research hypotheses: H_1 - The amount of time spent playing computer games is higher with the pupils of the 9th grade than with the pupils of the 6th grade; H_2 - The amount of time spent playing computer games is higher with the pupils living in a city, than with the pupils living in the countryside; H_3 - The amount of time spent playing computer games is higher with boys than with girls. From the stated hypotheses, the validity of hypothesis H_3 was confirmed.

Key words: Computer game, pupil, education.

Research Objectives

The main objective of the research was to find out the manner of using computer games by the pupils of primary schools, specifically to find out the amount of playing computer games and potential addictive behaviour of the 6th and the 9th grade pupils in the Olomouc Region, in the city and in the countryside. We were interested whether there are some differences in using computer games between girls and boys, between the 6th and the 9th grade and also whether there are some differences caused by the pupils´ place of residence (divided to countryside and city). The objective was to find, whether there are some verifiable differences in playing between the children aged ca. 11 (represented by the 6th grade) and the children aged ca. 14 (represented by the 9th grade). The sub-objective was to find out whether the pupils play the computer games during the classes, what is their favourite free time activity, what platforms do they use for playing the most and since what age have they been playing computer games. Another sub-objective was to find out which "game genre" do the pupils prefer.

Description of the research methodology

The quantitative research (Chráska, 2007) was chosen as the research strategy. Before the actual execution of the quantitative research using a questionnaire, the pupils were

motivated to fill in the questionnaire with the help of short familiarization with the present trends in the field of playing computer games.

The following hypotheses were set on the basis of studying field publications e.g.: Nešpor (1999), Nešpor (2011a), Nešpor (2011b), APA (2013), Pozdníková (2012), articles e.g.: Nešpor a Csémy (2007), Vacek (2011), Vacek (2010), Mlčoch (2009), Phan H. (2011) and on the basis of own considerations in compliance with the theoretical part.

We attach the major significance mainly to the field of frequency of playing computer games by the pupils, whether it depends on the age, grade or the place of residence. We are interested in whether the pupils will show some addictive behaviour, whether the games cause inattentiveness during the classes, which platforms and "game genres" are preferred by the pupils and when do they first encounter the playing.

Set hypotheses

H1 - The amount of time spent playing of computer games is higher with the pupils of the 9th grade than with the pupils of the 6th grade.

H2 – The amount of time spent playing computer games is higher with the pupils living in the city, than with the pupils living in the countryside.

H3 - The amount of time spent playing computer games is higher with boys than with girls.

Research methods

A questionnaire was chosen as the research method. The questionnaire includes 24 questions, which were ordered from the supposedly easier questions to more difficult questions and at the end there was again a decrease in the difficulty of the questions (Chráska, 2007). The last three questions were not directly connected with the researched topic but only with the age, the place of residence and the sex of a respondent. The informational question about the respondent served mainly for proving of the set hypotheses.

The questionnaire included the close-ended questions, where the respondents had to always choose on option, and the open-ended questions, where the respondents always had enough time and space to express their feelings and attitudes towards the given question. The questionnaire was completely anonymous.

The questionnaire was put together according to generally accepted rules (Chráska, 2007), we will not further discuss them due to the length of the paper.

Description of the research sample

The questionnaire took place on 4 randomly chosen primary schools in the Olomouc Region. Both city schools and countryside schools were chosen for the needs of the research. Primary school Holečkova Olomouc and PS Heyrovského Olomouc were among the city schools. Countryside primary schools were represented by PS Štěpánov and PS Dolany. The questionnaire took place only on the ISCED 2, specifically among pupils of the 6th and the 9th grade. Among the 9th graders it took place in June 2014, which means just shortly before leaving the primary school. Among the 6th graders it took place in September 2014, which means that they have just begun the ISCED 2. The reason for that was that we did not want the pupils to be affected by the second stage of the primary school. The total number of correspondents was 316, out of which 9 questionnaires were discarded due to an incomplete or untrustworthy completion. For the needs of questionnaire assessment, the pupil´s places of residence were divided only into two categories (city and countryside). The countryside category was mostly represented by the pupils from these villages: Dolany, Štěpánov, Liboš, Hnojice, Bělkovice – Lašťany and Tovéř. The city category was mostly represented by the pupils from the statutory city Olomouc.

Course of the questionnaire

Arrangements about the date of the questionnaire construction happened via telephone. The school management was very responsive and cooperative; they attached importance to the topic, which follows from their experience with working with children. Every class had 30 minutes to finish the questionnaire. After the introductory part, the pupils were acknowledged about the instructions for completion, so that any case of doubt is prevented and so that the pupils are familiar with the fact that the questionnaire is anonymous. Return of the questionnaire was high due to the maximal preparations before the completion and due to the pupil´s interest in this issue.

Methods of data processing and hypotheses testing

The hypotheses were being proved with the use of Student´s t–test in the Statistica 12.0 programme. Chráska (2007, p. 122, translation) writes that the Student´s t–test is one of the best known statistical tests of significance for metric data. With the help of Student´s t–test we can decide whether two sets of data, gained with the measuring in two different object groups (for example pupils), have the same arithmetic mean.

Testing of H_1: Amount of time spent playing computer games is higher with the pupils of the 9th grade of the primary school, than with the pupils of the 6th grade.

The objective of the hypothesis was to find out whether there are some differences between the frequency of playing by the 6th graders and the 9th graders. The Student´s t–test was used for the assessment of the hypothesis. We first formulate the zero hypothesis H_0 and the alternative hypothesis H_A for verifying of the hypothesis.

H_0: There are no differences between the amount of time spent playing computer games by the pupils of the 9th and the 6th grade of the primary school.

H_A: The amount of time spent playing computer games is higher with the pupils of the 9th grade of the primary school than with the pupils of the 6th grade.

Table 1: Assessment H_1 from the Statistica 12.0 programme

Group 1 vs. group 2	T-test for independent sample (HP1) Note: The variables were taken as independent samples										
	Average of group 1	Average of group 2	t-value	df	p	Valid GROUP 1	Valid GROUP 2	Standard deviation GROUP 1	Standard deviation GROUP 2	F	p variance
9th grade vs. 6th grade	119,8955	131,9820	-0,964386	299	0,335632	134	167	111,5567	105,1804	1,124919	0,470642

The level of significance of α was set for 0,05. From the table 1 it is evident that the calculated probability of an error p=0,335632 is greater than the chosen level of significance and therefore in our research sample there is no statistically significant difference between both groups, and we cannot reject the zero hypothesis. **Conclusion: H_1 was not confirmed.**

Testing of H_2: Amount of time spent playing computer games is higher with the pupils living in a city, than with the pupils living in the countryside.

The objective of the hypothesis was to find out whether there are some differences between the frequency of playing by the pupils living in the city and pupils living in the countryside. The Student´s t–test was used for the assessment of the hypothesis. We first formulate the zero hypothesis H_0 and the alternative hypothesis H_A for verifying of the hypothesis.

H_0: There are no differences between the amount of time spent playing computer games by the pupils living in the city and in the countryside.

H_A: The amount of time spent playing computer games is higher with the pupils living in the city than with the pupils living in the countryside.

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Table 2: Assessment H_2 from the Statistica 12.0 programme

Group 1 vs. group 2	T-test for independent sample (HP2) Note: The variables were taken as independent samples										
	Average of group 1	Average of group 2	t-value	df	p	Valid GROUP 1	Valid GROUP 2	Standard deviation GROUP 1	Standard deviation GROUP 2	F	p variance
City vs. countryside	131,6667	119,9385	0,932603	299	0,351777	171	130	110,7564	104,4339	1,124746	0,483278

The level of significance of α was set for 0,05. From the table 2 it is evident that the calculated probability of an error p=0,351777 is greater than the chosen level of significance and therefore in our research sample there is no statistically significant difference between both groups and we cannot reject the zero hypothesis. **Conclusion: H_2 was not confirmed.**

Testing of H_3: Amount of time spent playing computer games is higher with boys than with girls.

The objective of the hypothesis was to find out whether there are some differences between the frequency of playing by the boys and the girls. The Student´s t–test was used for the assessment of the hypothesis. We first formulate the zero hypothesis H_0 and the alternative hypothesis H_A for verifying of the hypothesis.

H_0: There are no differences between the amount of time spent playing computer games by boys and girls.

H_A: The amount of time spent playing computer games is higher with boys than with girls.

Table 3: Assessment H_3 from the Statistica 12.0 programme

Group 1 vs. group 2	T-test for independent sample (HP3) Note: The variables were taken as independent samples										
	Average of group 1	Average of group 2	t-value	df	p	Valid GROUP 1	Valid GROUP 2	Standard deviation GROUP 1	Standard deviation GROUP 2	F	p variance
Boys vs. Girls	174,4444	82,13669	8,114532	290	0,000000	153	139	114,2911	73,60797	2,410878	0,000000

The level of significance of α was set for 0,05. From the table 3 it is evident that the calculated probability of an error $p=1,39696*10^{-14}$ is smaller than the chosen level of significance and therefore in our research sample there is a statistically significant difference

in the amount of time spent playing computer games between boys and girls and therefore **we reject the zero hypothesis and we accept the alternative hypothesis** (the significance of the test is signalized by red colour in the table). On the basis of the Student´s t–test we confirm the hypothesis H_3. In our case there is greatly significant difference, because the level of significance is smaller than 0,01. **Conclusion: H_3 was confirmed.**

Discussion of results

The analysis of data, acquired with the help of the questionnaire, about the pupils of the 6th and the 9th grade of the primary schools in the Olomouc Region showed us that the pupils are familiar with and oriented in the researched issue and 96,1 % of all the pupils plays the computer games. This finding confirms the research held by NDP Group (The Video Game Industry Is Adding 2-17 Year-Old Gamers At A Rate Higher Than That Age Group´s Population Growth, 2011), which took place in the United States, where 91 % of all the pupils (questionnaire was filled in by 4136 people, 2–17 years) plays the computer games. The interest in computer games is confirmed by the pupil´s activity during the tutorial at the beginning of a class, before the completion of the questionnaire. The pupils who are often sleepy and passive began to be active, if the computer games were mentioned. I can definitely say that this topic was very attractive for the pupils of the research sample. It was also discovered that there are no differences in the number of pupils who play computer games and who live in the city or in the countryside.

We found out that there are no statistically significant differences in the amount of time spent playing computer games between the pupils of the 6th and the 9th grade (H_1) and also between the pupils living in the city and in the countryside (H_2).

Only one hypothesis, H_3, from the set hypotheses was confirmed, where we found out very significant difference in the amount of time spent playing computer games between boys and girls, with boys playing considerably more. The boys spend on the average 174 minutes per day with playing computer games whereas the girls spend 82 minutes per day on the average. We discovered that there are no statistically significant differences in the amount of playing between the pupils at the end of ISCED 1 (tested at the beginning of the 6th grade) and the pupils at the end of ISCED 2 (tested at the end of the 9th grade).

The hypothesis H_3 is confirmed by the research assumptions, where the boys like playing computer games in their free time the most (36,9 %) and the girls like to go out with friends the most (53,3 %). Only 11,3 % of the girls have playing computer games as their most favourite hobby.

Conclusion

On the basis of the research data assessment we also found out that 96,1 % of all pupils plays computer games, which is much more than we expected (80 %), 26,4 % even plays more than 3 hours a day, 14,6 % showed addictive behaviour. From the results it is evident that in the future almost every child will play computer games, so it is necessary that the experts, teachers and also parents gain the knowledge about the issue of computer games, mainly in the field of their influence on children. It is important to regulate the playing of computer games by children; however it is not advisable to strictly ban the computer games but to maintain a reasonable amount of playing, when the positive influence of the computer games prevails. It is then important to regulate the amount of playing and the type of games the children are playing (each game has the age suitability stated according to PEGI). Naturally, if the children are not regulated, the addiction can occur and the negative influence will fully prevail.

The results of the set hypotheses were very surprising, when the amount of time spent playing computer games was not different between the pupils of the 6^{th} and 9^{th} grade and there was no difference also between the pupils living in the city and in the countryside. The differences in the amount of playing between the ISCED 1 and ISCED 2 pupils were not confirmed. On the other hand, big differences were found in the amount of time spent playing computer games between boys and girls, when the boys spend on the average 174 minutes a day and the girls only 82 minutes a day. The findings show that the boys are more hazardous group than the girls.

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Service Evaluation Of Educational Process Through Importance-Performance Analysis: The Empirical Findings Of Brawijaya University Indonesia

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Abstract
The main objective of this study was to evaluate the service provision of educational process through Importance-Performance Analysis (IPA) models. The questionnaire was employed for gathering data, which its validity and reliability was calculated as well. The study population consisted of academic staff and students in each faculty at Brawijaya University Indonesia. Based on the Importance-Performance Analysis models, it was found that out of 40 assessed attributes, two attributes were in the first quarter of the matrix according to the academic staff perception as well as six attributes according to the students' perception and require special attention. Therefore, some recommendations have been provided for those attributes requiring more immediate attention.

Keywords: Service; Education; Importance-Performance Analysis; University; Indonesia

INTRODUCTION

Indonesia is facing new challenges in the higher education sector, especially in the increasingly competitive Indonesian tertiary education market. As competition increases in the higher education institution (HEI) sectors, public and private universities increasingly view students as consumers and therefore a consumer orientation is essential (Kusumawati, 2013a, 2013b, 2014). In spite of these efforts, there are still calls for universities to improve the quality of education services and the efficiency of education expenditures (World Bank, 2007). This is particularly so for small regional campuses that compete with larger universities in the state capitals. Campus management need to carefully monitor both the perceptions of prospective students within the catchment area, and the (dis)satisfaction levels of current students. In particular, small regional campuses face many challenges in competing with the broader range of learning and social opportunities available at larger universities in the state capital cities.

Institutions of higher education are increasingly realizing that they are part of the service industry and are putting greater emphasis on student satisfaction as they face many

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competitive pressures. On the one hand, student satisfaction has been related to recruitment and retention and academic success (Athiyaman, 1997; DeShields, Kara, & Kaynak, 2005; Elliott & Healy, 2001; Helgesen & Nesset, 2007) which has lead university administrators to pay great attention to those factors that help them to more effectively attract students and create a supportive learning environment. Tertiary students, like any other consumer decision makers, are presented with a diverse range of offerings in the education product purchase process. Clearly, a market orientation is as much a necessity for university management as it is for other consumer products. Kotler, Adam, Brown, & Armstrong (2003) pointed out that a marketing orientation is a philosophy that recognizes the achievement of organizational goals requires an understanding of the needs and wants of the target market, and then delivering satisfaction more effectively than rivals. According to Baldwin & James (2000, p.147), "What is needed is for all universities to conduct an honest analysis of their strengths and the populations they wish to serve, and use this to define a genuinely distinctive mission, rather than the bland pieties now found in most mission statements which are indistinguishable from each other. Their competitiveness would then be focused on getting through to those prospective students who have been defined as the target market, and convincing them that this is the type of university they should attend". This concept is relevant to the Indonesian tertiary sector.

Aitken (1982) found that academic performance is one of the most important factors in determining satisfaction, and Pike (1991) concludes that satisfaction exerts greater influence on grades than academic performance on satisfaction. According to Bandura (1977) and Schunk (1991), learners use self-regulatory attributes to control their personal learning processes and self-efficacy influences choice, efforts, and volition. Successful students seem to have an ability to motivate themselves to complete a task, while less successful students have difficulty in developing self-motivation skills (Dembo & Eaton, 2000). There can be few industry sectors as demanding as tertiary education when it comes to achieving customer satisfaction. The potential for critical incidents to occur during students' encounters with administrative, academic, library, security and hospitality staff, and all service provision in educational process which can impact on satisfaction, is high. Critical incidents are those exchanges between the customer and service provider that result in a particularly positive or negative experience for either party (Bitner, Booms, & Tetreault, 1990). Many such encounters are in group situations such as lectures and tutorials, in which the student has limited control.

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This study represents one stage in the development of an ongoing perceptions and satisfaction monitoring program by a relatively small regional campus. The paper reports the findings of initial steps taken to identify the range of attributes used to evaluate standard of educational process implemented by Brawijaya University, and how the current situation is perceived by students and academic staff segment.

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CURRENT PRACTICE BY EDUCATION INSTITUTIONS IN INDONESIA

The introduction of the National Standard of Higher Education (SNPT) by Ministry of National Education (MONE) on regulation No. 41/2007 and government regulation No. 19/2005 has prompted universities to seriously commit themselves in providing high quality education to their students. There are little differences in terms of the standards content, but the number of areas remains the same and consists of eight areas of standards. The eight areas of standards to be covered namely: (1) Graduates competency; (2) learning content; (3) educational process; (4) Education Assessment; (5) Academic and non academic staff; (6) Infrastructure; (7) Management; (8) Financing. On 2014, Ministry of National Education (MONE) revised their regulation through regulation No. 49/2014 for better improving the learning quality of higher education.

In line with the developments of education, the standard of national education process has evolved with the establishment of the Ministry of National Education (MONE) regulation No. 49/2014 on the National Standard of Higher Education (SNPT). The standard of educational process can be interpreted as a reference or criteria established in a planned or designed for learning implementation. In accordance to the Ministry of National Education (MONE) regulation No. 41/2007 and government regulation No. 19/2005, the standard of educational process developed by educators with refers to the syllabus and educational plans, while its essence lies in learning activities that decomposes in refer to the development of assessment that cannot be separated from the learning methods. In this study, the standard of national education as set out by government regulation No. 19/2005 was used to evaluate the service provision of education. The four areas of education process standards to be covered namely: (1) educational process planning; (2) implementation of educational process; (3) assessment of educational result, and; (4) monitoring of educational process.

Higher education institutions are required to regularly review the quality of education and services rendered to their students. In the past, there was no special study focusing on the quality of education taking into account evaluations particularly from students' perspective as well as academic staff. Therefore, this study is attempted to assess quality performance on the basis of educational process in Brawijaya University Malang, a selected Indonesian's public university at East Java Province. The specific objective of this study is to evaluate the service provision of educational process based on the standard of education process referring to the

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Ministry of National Education (MONE) regulation No. 41/2007 and government regulation No. 19/2005 through Importance-Performance Analysis (IPA) models.

LITERATURE REVIEW

It has been claimed by Shuib et al. (2007) that external quality assurance mechanism implemented through accreditation, validation and audit by peer review is deemed effective to ascertain continuous improvement. The implementation has lead education practitioners to comply with the quality and standards set forth in the Quality Assurance guidelines. Lagrosen et al. (2004) also supported the idea that that managers of academic business schools have to perform well on the quality dimensions proposed as if they want to satisfy their students. It is also claimed by Juwaheer (2007) that universities should begin seriously to assess how well they are anticipating, meeting and delighting students; as well as their primary focus on understanding students' needs in order to check on their quality performance.

Berry and Parasuraman (1992) argued that the success of a service organization depends on the ability of service providers to consistently meeting or exceeding customers' expectation. Therefore, quality components must be measured regularly to response to the any variation in the environments and focusing on stakeholders' expectation. Both researchers further believed that the findings are very practical for the higher education service providers-especially their faculty administrators and academic staffs-to continuously improve the services rendered to the students. O'Neill and Palmer (2004) found that students have different ideas in connecting the aspects of administrative support and the quality improvements efforts as they think most importance to them. Therefore, it is imperative for education institutions to undergo thorough research in the students' and academic staff evaluation of service experiences. This should include decision making ranging from educational process planning, implementation of educational process, assessment of educational result, and monitoring of educational process. The planning of learning process includes a syllabus and educational plans, which contains the identity of subjects, standards of competency, basic competency, indicators of competency achievement, learning objectives, learning materials, time allocation, teaching methods, learning activities, assessment of learning outcomes, and learning resources. Implementation of the learning process must consider the maximum class sizes, academic staff minimum workload, textbooks, and classroom management. Assessment of learning outcomes is conducted by academic staff on learning outcomes to measure the level of competency achievement by student, as well as

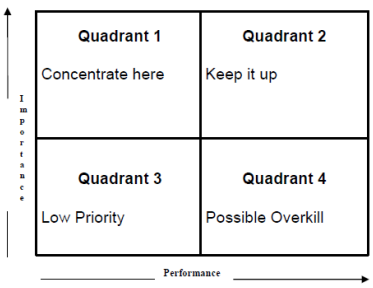
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used for preparing of learning outcomes progress report and improving the learning process. Assessment is done in a consistent, systematic, and programmed using the examination through written or oral test, and non-examination through observations, attitudes measurements, assessment of student's assignments, projects and/or products, portfolios, and self-assessment. Assessment of learning outcomes conducted through Education Assessment Standard and Assessment Guide by group of subject. Monitoring the learning process is conducted in several ways, namely monitoring, supervision, evaluation, and reporting.

IMPORTANCE-PERFORMANCE ANALYSIS (IPA)

Since satisfaction resulted from expectations about important attributes and the perceived performance of certain attributes (Myers & Alpert, 1968), it is prominence to identifying the university's attributes considered important for students and academic staffs as well as understanding how well a university is perceived across a range of attributes. In this way, Importance-Performance analysis (IPA) examines both performance and importance of an attribute and analysis it separately, rather than summed as in Fishbein's (1967) multiattribute model. This is important since two summed scores could represent either high importance/low performance or low importance/high performance (Ennew, Reed, & Binks, 1993). For this reason, IPA was selected as a valid method and it has arguably been under-utilized in the education marketing literature as first reported by Martilla and James (1977).

The IPA matrix, which is presented in Figure 1, represents the two dimensions of attribute importance and performance in four quadrants. The Y-axis plots respondents' importance of the attributes, while the X-axis highlights the perceived product performance on the same attributes. Quadrant 1 features attributes rated most important, but where the product is not perceived to perform strongly. This signals a need for remedial action to improve perceived performance. Quadrant 2 features attributes rated important, and where the product is perceived to perform strongly. It is these attributes that should be reinforced in promotions. Quadrants 3 and 4 feature attributes rated less important, and which should therefore have a lower priority in promotions.



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Fig. 1. The Original Importance-Performance Analysis Grid from Martilla & James (1977).

Previous studies has been demonstrated the versatility of IPA in a range of applications, including for example: the evaluation of breakfast food brands (Sethna, 1982), therapeutic recreation services (Kennedy, 1986), dental practices (Nitse & Bush, 1993) and holiday destinations (Pike & Ryan, 2003). Despite the simplicity of the technique, IPA has been under-reported in education marketing and student evaluation research. In the education field, IPA has previously been reported in an evaluation of public and private higher education (Angel, Hefferman, & Megicks, 2008; Joseph, Yakhou, & Stone, 2005; Kitcharoen, 2004; O'Neill & Palmer, 2004), business schools (Ford, Joseph, & Joseph, 1999) and tertiary students' perceptions of service quality (Wright & O'Neill, 2002). Contributions in this regard have also included the evaluation of adult education (Alberty & Mihalik, 1989), faculty course quality (Ortinau, Bush, Bush, & Twible, 1989), business school curriculum (Nale, Rauch, Wathen, & Barr, 2000), market positioning of North American colleges (Chapman, 1993), and in Australia the identification of determinant university attributes (Pike, 2004). No applications example of this type of approach in another field was reported by Guadangalo (1985), who used of the method to evaluate a 10-kilometre running race over three consecutive years. Recommendations from the first year IPA results were implemented, and then tracked for improved performance in the following year. The purpose of this study was to utilise IPA for evaluating service provision of educational process based on Bawijaya University's student and academic staff. It was assumed IPA would enable to identify the gaps between expectations and performance, and monitor the effectiveness of any resultant changes made to the university and faculty as a result of the feedback.

In this study, firstly using evaluation approach based on students and academic staffs perception of the standard of educational process in the current situation. The standard of educational process was described in four areas namely: (1) educational process planning; (2) implementation of educational process; (3) assessment of educational result, and; (4) monitoring of educational process (with 40 criteria). Then, the above criteria values were evaluated and the results were put in the IP matrix. In other words, in the current research by using a combination of evaluation results and the IPA importance dimension, it was attempted to solve the main problems of internal evaluation (which is paying attention to the current situation) and eventually some solutions were presented in order to improve the situation which was raised from the needs and applications of customers.

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RESEARCH METHODOLOGY

The data for this study was collected through a questionnaire to undergraduate students and academic staffs from 12 faculties and two programs at Brawijaya University, located in the town of Malang, Indonesia. The instrument used was divided into two sections; Section I collected personal information from the respondents, and Section II refers to respondents' perceptions of the importance and performance of key attributes and their satisfaction relating to these attributes. The attributes under consideration are: educational process planning, implementation, assessment of educational result and monitoring of educational process. In total there were 40 benefits identified from the National Standard of Higher Education regulation by the Ministry of National Education (MONE). The validity and the reliability of the IPA grid have been tested successfully (Skok, Kophamel, & Richardson, 2001).

To the attributes assessed, students were firstly asked to rate the importance of 40 university's attributes from the standard of educational process. A four point scale was used, anchored at 'Not important at all' (1) and 'Very important' (4) for measuring the attributes' importance. In a same section respondents were then asked to rate their perceptions of the service provision of educational process' performance across the same range of attributes. Again, a four point scale was used, anchored at 'Very poor' (1) and 'Excellent' (4). From 1,660 samples chosen by purposive sampling technique, 1,112 total respondents completed the survey; consist of 609 students and 503 academic staffs, giving a 66.99% response rate.

FINDINGS AND DISCUSSION

Out of 609 students participated, 53,69% (n=327) identified themselves as female. Similar to those students respondents, the majority of academic staff sample 54,08% (n=272) were also female. A majority of students' respondent, 58.2% (n=458) were between ages of 20-22, while majority of academic staffs' respondent, 31,41% (n=158) were between ages of 30-39. This sample is representative of the all students and academic staffs at Brawijaya University.

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Table 2. Importance-Performance Ratings by Students and Academic Staff.

Attributes	Student		Academic staff	
	Mean Importance	Mean Performance	Mean Importance	Mean Performance
Educational process planning				
1. Availability of syllabus for each subject	3,66	2,91	3,86	3,28
2. Syllabus consist of learning outcome, learning material, learning method, learning sources and learning assessment	3,67	2,98	3,85	3,23
3. Learning plan for semester given before the lecture	3,68	3,04	3,84	3,26
4. Availability Learning plan for semester for all subjects	3,65	2,95	3,79	3,13
5. Learning plan for semester accordance with the current curriculum	3,65	3	3,79	3,15
6. Learning plan for semester according to the competency-based curriculum	3,61	2,99	3,77	3,06
Implementation of Educational Process				
1. The maximum number of participants lecturing 40 students in one class	3,46	2,51	3,65	2,74
2. The number of students Smaller adapted to the characteristics of subjects	3,47	2,63	3,55	2,75
3. Class in accordance with Learning plan for semester	3,61	2,95	3,74	3,23
4. Class implemented according to the schedule of lectures	3,67	2,87	3,76	3,29
5. Material given lectures relevant to the subject being taught	3,69	3,15	3,86	3,36
6. Material lectures given in accordance with the latest developments and future	3,74	3,11	3,8	3,2
7. The process is done in an interactive learning, inspiring, fun, challenging, and motivating students	3,76	2,91	3,79	3,15
8. Teaching methods adapted to the characteristics of students and courses	3,64	2,81	3,65	2,99
9. Learning tutorial using a small group of students	3,44	2,76	3,46	2,86
10. Learning tutorials for the deepening of the material	3,56	2,82	3,56	2,88
11. Self-regulated learning frees students to study according to their own learning style	3,56	2,79	3,47	2,94
12. facilitate independent learning students to find extensive information about the lecture material being studied	3,63	2,94	3,64	3,13
Assessment of educational result				
1. Giving the exam according to student results	3,63	2,99	3,74	3,26

2. Assessment exam reflects the learning process has been implemented consistently and programmed	3,6	2,99	3,76	3,25
3. Exam is given in accordance with the expected competencies	3,66	2,98	3,79	3,26
4. Assessment exam reflects the acquisition of knowledge, attitudes, skills and behavior in accordance with the expected competencies	3,65	3,06	3,72	3,17
5. The control and utilization of the knowledge, skills and behaviors in the execution of duties	3,64	3,04	3,71	3,15
6. The provision of individual or group tasks in accordance with the student learning outcomes	3,56	3,04	3,63	3,19
7. Giving feedback on tasks assigned by lecturer	3,62	2,98	3,64	2,98
8. Assessment results reflect learning outcomes	3,59	2,95	3,61	3,09
9. The assessment criteria are clear, consistent, and are known openly by students	3,61	2,82	3,64	3,12
Monitoring of educational process				
1. Monitoring carried out on the whole process of learning by the leadership	3,48	2,79	3,61	2,91
2. Monitoring of the learning process is done each semester	3,58	2,84	3,67	3,14
3. Lecturers provide examples and illustrations in the lecture	3,71	2,99	3,76	3,32
4. Lecturer provide opportunities and services to students to consult about the material and the task given	3,75	2,99	3,79	3,35
5. Lecturer facilitate students in the process of guiding thesis	3,75	3,09	3,82	3,38
6. Lecturer facilitate students in the process of coaching Internship	3,75	3,1	3,77	3,35
7. The existence of the teaching faculty evaluation by students	3,68	2,9	3,76	3,39
8. The process of learning is evaluated every semester by a mechanism that has been set	3,67	2,95	3,74	3,27
9. The existence of reports on the implementation process of learning by lecturers which contains the constraints and proposed improvements	3,58	2,74	3,6	2,85
10. The existence of a report evaluating the learning process every semester	3,59	2,9	3,68	3,02
11. The award is given to the faculty member has to meet the standards	3,58	2,81	3,62	2,75
12. Strikes are educating the lecturers who do not meet the standards	3,68	2,72	3,66	2,77

13. The existence of the corrective action against the barrier, according to the findings of the evaluation	3,69	2,81	3,72	2,88

From the Table 2 it is possible to learn the mean rating for both I-P scale, and conclude that students are quite satisfied with the performance (mean of 2.51), but results also convey a higher importance to each of the items under analysis, registering a mean of 3.15. Once the mean scores for each pair of importance and performance features are calculated, they are plotted on a two-dimensional, four quadrant matrix (see Fig. 2 and Fig. 3). Fig. 2 and Fig. 3 give a graphic representation of the features compiled in Table 2. In Fig. 2 and Fig. 3 it can be seen a more detailed analysis of attributes. Thus, it can be noted that majority of the attributes studied are positioned in Quadrant 2 - "*Keep up with the good work*", which correspond to attributes with high performance assessments, and are also judged as high in importance by students and academic staffs, which means the level of service provided in those attributes is satisfactory. These issues are of extreme importance to students and academic staffs are aspects where Brawijaya University has a good performance, so it should keep up the standards as a way to better correspond to their needs.

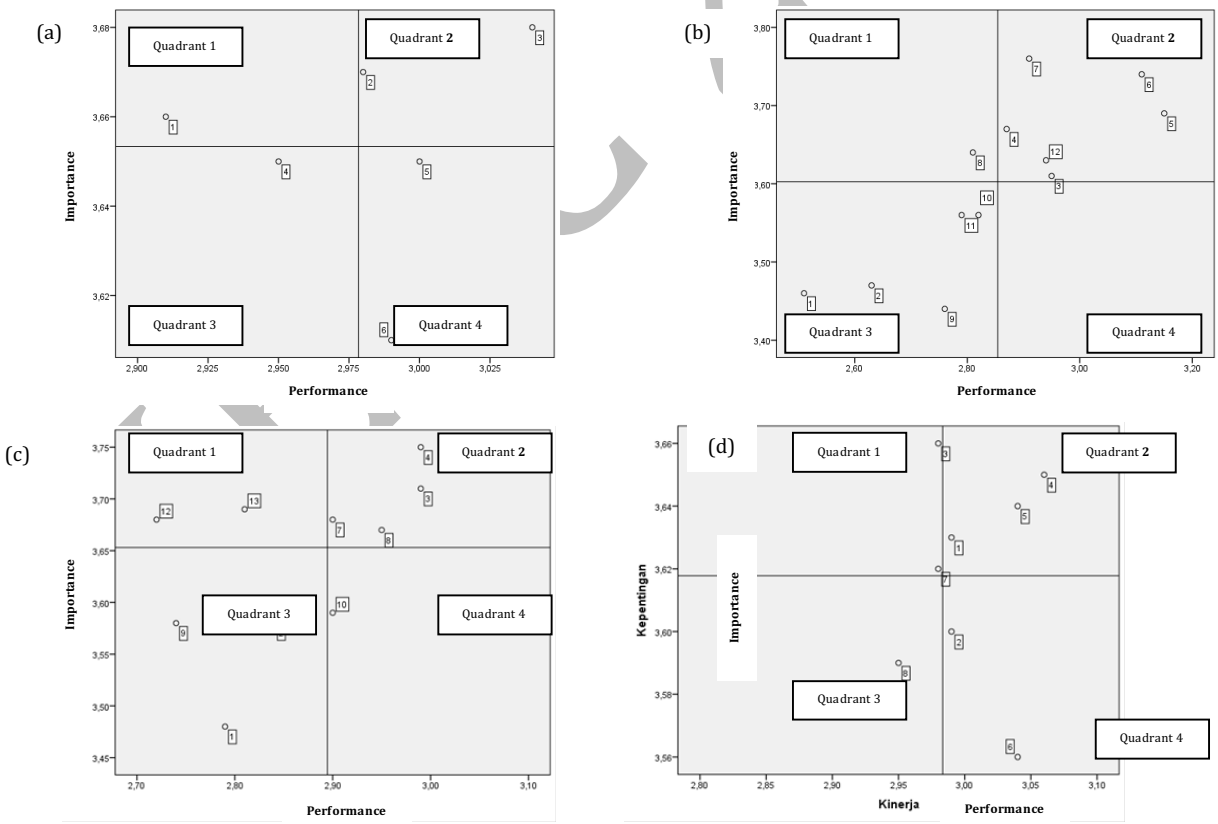


Fig. 2. (a) Students' IPA grid on educational process planning; (b) Students' IPA grid on implementation of educational process; (c) Students' IPA grid on assessment of educational result; (d) Students' IPA grid on monitoring of educational processs

(a) (b)

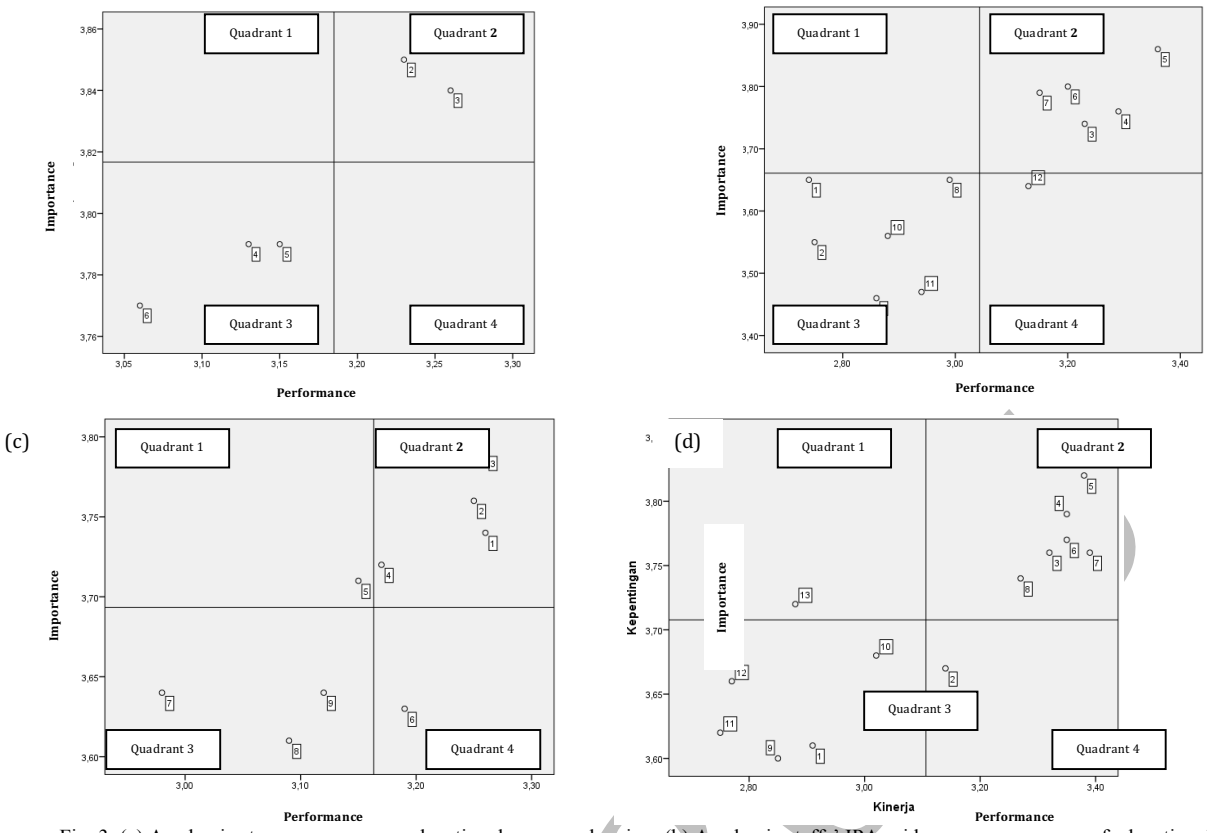


Fig. 3. (a) Academic staffs' IPA grid on educational process planning; (b) Academic staffs' IPA grid on implementation of educational process; (c) Academic staffs' IPA grid on assessment of educational result; (d) Academic staffs' IPA grid on monitoring of educational process

The IPA grid (see Fig. 3) reveals the information that according to the respondents of lecturers, among the 40 attributes evaluated only two attributes are a top priority and need to be more immediate improvement because it is considered important in the educational process but the performance is bad, namely: (1). Acquisition and utilization of knowledge, skills and behaviors in the execution of tasks in a variable Learning Outcomes Assessment; (2). Corrective action against the barrier, according to the findings of the evaluation of learning process monitoring.

On the other hand, student respondents consider that there are six attributes that should be the main priority of the improvement (see Fig. 2), namely: (1). Availability of syllabus for each course in the Learning Process Planning variables; (2). Learning methods adapted to the characteristics of students and courses in variable Learning Process Implementation; (3). Exams are given in accordance with the expected competencies in variable Learning Outcomes Assessment; (4) Providing feedback to the task given by the lecturer in variable Learning Outcomes Assessment; (5). The process of reprimand educates the lecturers who do not meet the standard in variable Learning Process Monitoring; and (6). Corrective action

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against the barrier, according to the findings of the evaluation in the Learning Process Monitoring variables.

Brawijaya University must focus in monitoring of educational process, because this is the area that some of attributes is positioned in Quadrant A. Given the importance of these aspects it will be in this area that Brawijaya University must be aware and concentrate efforts in order to better correspond to the needs of their students. Fig. 2 and Fig. 3 also show the area of lower importance to students but, at the same time, Brawijaya University has a reasonable performance relatively to general aspects in their opinion. This attribute incorporates aspects related to the monitoring of educational process, such as learning plan for semester accordance with the current curriculum, learning plan for semester according to the competency-based curriculum, assessment exam reflects the learning process has been implemented consistently and programmed, the provision of individual or group assignments according to the student results, and the availability of learning process evaluation report every semester.

On the other hand the area of upmost importance to students is the Implementation of Educational Process (see Fig.2). This attribute measures aspects related to the process of learning is conducted in an interactive learning, inspiring, fun, challenging, and motivating students. We can also observe, in Table 2, attributes like the acquisition and utilization of knowledge, skills and behaviors in the execution of duties, and corrective action against the barrier, according to the findings of the evaluation registering high values in academic staffs' counts. The first one includes the following aspects: teachers' friendliness, personalized attention, easy communication with teachers, teachers explaining with clarity and precision the contents of subjects, teachers with scientific ability to answer any question, reasonable assessment, and bibliography recommendation. The second one incorporate questions like: evaluation and corrective actions from the faculty management both incidental or regularly. From the results we can draw conclusions regarding importance and performance measures.

In general, academic staffs and students give a good perception of the whole performance of the educational service process in the Faculty or Program at Brawijaya University. However, there were some differences between academic staffs and students' perception in terms of evaluating the existing service provisional of the educational process at Brawijaya University. Out of 40 attributes, academic staff identified only two attributes positioned in

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Quadrant 1, while students exposed only six attributes should be prioritized and required more special attention since the attributes' performance were not satisfied.

Academic staffs revealed that there were 18 attributes positioned in Quadrant 2, while students revealed there were 17 attributes positioned in Quadrant 2. Among these attributes, 15 attributes found to be similar for both students and academic staffs' perception, which mean that these attributes should be maintained because the attributes were considered important and its performance has been good. The similarity of these attributes preferred by both students and academics staff accounted around 85%.

According to the academics staff, there were 17 attributes that their performance needs to be improved but should not be prioritized since they were considered less important in the learning process, while student revealed that there were only 12 attributes in Quadrant 3. Among these attributes, both students and academic staffs considered 11 similar attributes. Thus, the similarity of these attributes preferred by both students and academics staff accounted around more than 90%. For Quadrant 4, academic staffs pointed out three attributes while students identified five attributes which considered excessive. Among these attributes, both students and academic staffs highlighted only one similar attribute namely the provision of individual or group assignments according to the student learning results.

The Indonesian tertiary education sector operates in a competitive and dynamic environment. Shifting demand for services and the diverse composition of student cohorts necessitates a market orientated philosophy with some consideration of students as consumers. In addition, service delivery and evaluation in tertiary education is a relatively long term process, compared to the more immediate delivery and evaluation evident in many other service sectors. The likelihood of critical incidents occurring during the delivery of monitoring of educational process is high. The study demonstrates IPA's application as an effective tool for teaching evaluation in such an environment. Importantly, IPA addresses some of the key limitations of traditional teaching evaluation instruments, particularly using an end of semester survey to evaluate student satisfaction. The validity of any teaching evaluation instruments relies on the salience of the attribute scale items to respondents. Traditional teaching evaluation instruments in university settings often do not consider the variance in the level of importance placed on the battery of scale items used to measure student satisfaction. IPA provides a simple tool which adequately considers both importance

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and performance across scale items, providing useful perspectives for both evaluation and planning.

CONCLUSION AND RECOMMENDATION

The purpose of this study was to trial the application of IPA to provide insights into student and academic staff expectations as well as evaluation. The results highlighted clear gaps between the means for attribute importance and performance. The IPA matrix graphically highlighted six attributes based on students' perception and two attributes based on academic staffs' perception where corrective action was required. These attributes mostly related to the performance of monitoring of educational process. In this regard the existence of the corrective action against the barrier, according to the findings of the evaluation of educational process.

IPA has been underutilized in the educational marketing literature. In this study, the IPA approach provided greater insights into student satisfaction than those provided in the traditional end of semester unit evaluation. On this basis IPA is recommended to other educators, particularly those becoming involved in a unit for the first time when expectation-performance benchmarks would be of particular value. The IPA approach enables academic staff to plan and track changes made to the unit based on students' feedback. It also provides additional accountability and opportunities for educators to demonstrate, over time, refinements to and the effectiveness of their educational process. In this study, the power of the IPA matrix was as evident as in many of the previous studies published in other fields. In those studies, listed at the beginning of the paper, clear distinctions are often made between those attributes deemed important in Quadrants 1 and 2, and those attributes placed in Quadrants 3 and 4. In this study yet, few attributes rated high enough to be placed in Quadrants 1, which is an indication of the validity of the standard university unit evaluation questionnaire and the salience of the attributes to the students and academic staffs in general. However, the IPA format did enable gap analysis to be undertaken. It is this aspect that ultimately provided the most value to the teaching team, who were able to track an improvement in performance, while understanding future challenges. To Brawijaya University's board it will provide a richer understanding of students' and academic staff reactions and perceptions about services offered by this institution. From the IPA, the board will not only know which attributes require immediate attention, but also, why they require

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this attention. Further research is required, however, to better understand the consistent difference in mean importance ratings in each semester.

There are a number of opportunities to build on the findings of this study through future research. Regular periodic use of IPA provides a means to test the validity of the teaching evaluation instrument to different cohorts, over time is imperative. That is, the oral introduction by the academic staff to the survey should more explicitly explain how crucial it is that students carefully consider the attribute importance items. It is suggested researchers could adapt the longitudinal IPA approach used in this study by applying the evaluation instrument across multiple cohorts of undergraduate and postgraduate students. Such data could be used to evaluate individual units, and be pooled to enable data reduction techniques such as Exploratory Factor Analysis and Cluster Analysis. Separate IPA matrices could then be easily developed to plot the scores for resultant factors across different segments. The IPA approach could also be extended to better reflect the two-way process of teaching and learning. In addition to considering the importance and performance of attributes linked to teaching, an IPA instrument could be developed allowing students to consider importance and performance of attributes linked to learning. This could involve both self and peer assessment. The teaching team could also rank importance and performance of attributes linked to learning. Such an approach presents some complexity, but is worthy of further exploration and consideration for future research.

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Thai Education: Breathing Of The Marginal People

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Abstract
As we known, education is the sacred path of the nation development and its major role is to develop the total development of the learners, intelligence and societal spheres. Every nationsin the world proceed that the highest quality of education is the processes or approaches leading to how to handle the learners' achievement and get the happiness in the changing society. For the Thai education heartedly given to the marginal people those should receive from the government that 1) the sufficient budget 2) the teacher understanding in the marginal people identity 3) the appropriate vocational/career education and 4) the studying on literacy. If the Thai government can administrate in these prospects, this situation will not be "Unheard and Unseen from the majority."

Key Words : 1) Thai education 2) the Marginal people

Introduction

In the general sense education is a form of learning in which the incorporating knowledge, skills values and societal beliefs of a group of people. Basically, three types of education system, formal schooling, informal schooling and non-formal schooling are set up in every society and plays the transformation from one generation to generation.Education has itself a status of the ***" matter sender"*** with a high expectation to the learners as the receivers ,it can be called the essence of the whole development. Thus the national expectations produced are the civil citizen creation and building. This discourse that no one can refuses.Although Thailand has herself a long history of education and civilization but the true practice in Thai content, there are quite outstanding classes, exploiting and exploited. The exploited one is the marginal people whom are defined in the term of lack of scant power,prestige and privilege they have got. Moreover, the Thai society has a marginalizationthis is the social exclusion which the process in which individuals or entire communities of people are systematically blocked from (or denied full access to) various rights, opportunities and resources that are normally available to members of a different group, and which are fundamental to social integration within that particular group for example, housing, employment, healthcare, civic engagement, democratic participation, and due process. Alienationor disenfranchisementresulting from social exclusion is often connected to a person's social class, educational status, childhood relationships, living standards, or personal choices in fashion. Such exclusionary forms of discrimination may also apply to people with a disability,minorities, members of the

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community, drug users, "seniors", or young people. Anyone who appears to deviate in any way from the "perceived norm" of a population may thereby become subject to coarse or subtle forms of social exclusion.(Young, I. M. (2000).The outcome of social exclusion is that affected individuals or communities are prevented from participating fully in the economic, social, and political life of the society in which they live.

The Uncertainty in the Thai educational contextualization

National purposes for pursuing education can vary. Understanding the means and targets or goals of educational socialization process may also differ according to the nation socio-cultural paradigm used. Naturally, learners also pursue education for its own sake- to satisfy innate curiosity, interested in specific subjects or specific domain/skills ,or for overall personal development.Thai education in the present day likes an evil who can appear in different uncertainty body, it depends on its duty or responsibility. In general perspective education is often understood as a means of overcoming disability people and marginal one, achieving greater equality and acquiring wealth and status for all of people. However, the Thai marginal people quite less receive the education provided from the government. The uncertainty of those will be shown in the projection as the follows;

1. **The uncertainty of the national policy:** Thai education seems to be lack of its unity of administration and management. As a matter of fact, the most of Thai educational policies in each period strongly are responded under the satisfaction of the**"Actors**"(Minister of Ministry of Education).Educational policies sometimes are not fit into the basic national contextualization especially the holistic ofthe national development.“ Hidden agenda” still appears in each period of the national education plan.

2. **The uncertainty of instruction:** quality of education is distorted from most of educationists, it is always majorly gears only in how the educates can enroll in the labor market place both in government and private sectors for solving of the unemployment situation. This can be said that it is only the manifest signifier of the concrete one.The quality or learners' achievement is their survival in the present situation within the happy existence. Besides, the quality of education concerned in activities are those can implement in their daily way,too.

3. **The uncertainty of learners' activities:** although in this time learners' activities are developed in the different approaches to be fit into their interest and aptitude, but some activitiesare tightly press without systematic thinking on the Thai contextualization .So the educational sin is strongly appeared to students in many places of educational institutions.

Breathing of the Marginal People :How Education should be?

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Education is the action or process of educating of being educated and the knowledge and development resulting from education process.(Webster's New Encyclopedic Dictionary;318) In the writer definition education means the ways "to and how" to improve the quality of life for the total happiness. Thus, three types of education in society, formal school, in-formal school and non-formal school will be for all of the citizen in the nation.As a matter of fact there are several types of people/habitants in one nation, the exploiting and the exploited one in generally.The marginal people is also the exploited class. Known already that the marginal people is the word of majority in society given to whom have a scant opportunity or power engagement. In this way, education provided from government as the marginal people breathing should bedone to contribute directly and actively towards on the basic right of human beings are as follows;

1. **The Sufficient budget** :The Thai Ministry of Education has taken upon itself the task of population education, but the empirical data usually shows that budget allocated from the government is insufficient.The relationship between education and national budget is two–way. The higher the rate of the marginal people growth,(Mahran,M.,1993) the greater burden on educational budget. This situation is always taken place in every period of educational policy. Seen easily in the remote and mountainous areas that many schools lack of educational assets , technology and computers.Conversely, the sufficiency budget on education must be fostered in everywhere of school.

2. **The instructors understanding in the marginal people "identity" :** since its establishment, identity is the whole culture of norms ,beliefs and social values. Thus teacher who plays the major role of the marginal people socialization should encourage them proudly and positively on their identity. Pointing out to the marginal peopleimportance of developing self-esteem and unity should be guided by the teachers .An appropriateness of vocational or career education will be leaded since it is the indirection of the national prosperity.

3. **The marginal people importance perceived from the majority:**Thai population must perceive in the importance of the marginal people because they are Thai citizen not be a **" social defendant"**. So the educational opportunity provided to them are not only literacy but also technology awareness,right communication based on the social fact. This will be the holistic sustainability of the nation.

4. **The variety of techniques on teaching:** there are many methodologies and techniques in pedagogic teaching**.** The school in any the marginal people places must concerns to the varieties of techniques on teaching such as project-based learning(PBL),

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professional learning community (PLC) and other. Good techniques of teaching usually base on their potentiality, ability and competency, moreover the community based on.

Conclusion

The breathing of the marginal people as the breathing of the common people. So the education given to them is the heart of the Thai government to maintain its present and its future.For the standpoint of an educator who is aware and informed about these issues that arise in the current global society. This is necessary because of the relevance of the issues, on the one hand, and the dynamics that characterize education, on the other. The issues of government administration will be dealt with above. If the Thai government can solve these problems, the nation will be prosperous in the changing society.

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The Adaptation and Validation of the Turkish Version of the Three-Branch Emotional Intelligence Rating Scale

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Abstract
The aim of this research is to examine the validity and reliability of the Turkish Version of the Three-Branch Emotional Intelligence Rating Scale (EIRS; Anguiano-Carrasco, MacCann, Geiger, Seybert, and Roberts, 2015). Participants were 325 university students. The results of confirmatory factor analysis demonstrated that the 18 items loaded on three factors (Perception, Understanding and Management) and the three-dimensional model was well fit (x^2*=357.85, df=132, RMSEA=.0073, NFI=.93, NNFI=.94, CFI=.95, IFI=.95, RFI=.91, AGFI=.86 and SRMR=.074*). The internal consistency coefficients were .75 for perception subscale, .86 for understanding subscale, .77 for management subscale and .85 for the overall scale. The corrected item-total correlations of EIRS ranged from .20 to .61. Overall findings demonstrated that this scale is a valid and reliable instrument for measuring individuals' tendencies to emotional intelligence.

Keywords: Emotional intelligence, validity, reliability, confirmatory factor analysis

Introduction

Students in the new era have to be very well prepared for jobs involving information and technology. They have to be able to deal with stressful competition situations or the costs can be very high for the society and the individuals themselves (Parker at al, 2004). Rapidly changing social and professional conditions has been increasing the stress level of individuals at home, at work and in social environment. One's ability to cope with challenging and overwhelming stress and demands the new era brought, is a vital element of success in life, school and work. When we consider the importance of academic success, we can see why there is such a substantial literature on promoting academic success at schools. Early study attempted to explain the role of cognitive process in success and research focused on this concept. One famous description of Cognitive intelligence was "The ability to learn new things, recall information, think rationally, apply knowledge and solve problems." (Kaplan & Sadock, 1991) Cognitive intelligence (IQ) was considered to be the most important predictor of success until some researchers claimed that IQ generates about %25 of the success and performance at work (Hunter&Hunter,1984), and that social and emotional capability – which would be named "emotional intelligence" later - was a four times more important determinant

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than IQ in success (Sternberg, 1996). We can look at Thorndike's “social intelligence” to understand the basis of EI. He defined social intelligence as "the ability to understand and manage others, to act wisely in human relations" in 1920. Later, Gardner used the term “interpersonal intelligence” to replace the term “social intelligence”, as a component of his Multiple Intelligences Theory (1983). Leuner used the term "emotional intelligence" referring to social and emotional capability for the first time in his study in 1966. He stated that women who were seperated from their mothers at an early age had lower "emotional intelligence" and as a result of this, they reject their roles in the social life. After him, Payne used the term in English in his doctoral study in 1986. Greenspan stated that emotions were the basis of human intelligence in 1989. Salovey and Mayer made the first formal definition of “emotional intelligence” in 1990. They described "emotional intelligence" as an individuals capability to understand their own and other people's feelings and emotions and differentiate between them and use this data to manage their thinking and behaviour (Salovey & Mayer 1990). Their description is widely used to explain “emotional intelligence” today. The term “emotional intelligence” did not catch public attention until Goleman's book in 1995. In that book, Goleman discussed that skills like self-awareness, emphaty, and self-discipline have an important role in determining the success in personal and professional life. Goleman also stated that violence, irresponsible behaviours and insolance were undermining the education and society and claimed that "emotional intelligence" was the key to solve these problems. This caught attention of educators and the public so the term “emotional" intelligence started to be widely used along with education. Goleman's study promoted many scientists and researchers to make definitions and developing means of measuring the emotional intelligence skills. Reuven Bar-On produced the first verified measure of "emotionally intelligent behavior" the EQ-i. He defined "emotional intelligence" as a group of non-cognitive capabilities, abilities, and skills that influence one's competency to succeed in dealing with demands and pressures of the environment" Bar-On (2002). Many studies have been conducted to find and explain the correlation between EI and academic success after Goleman’s study. Rozell, Pettijohn & Parker's utilized the Goleman (1995) scale and the results showed a small but important connection. Schutte's finding was that the students’ self-report EI measure predicted their academic grade averages significantly (1998). Petrides, Fredrickson and Furnham’s study (2004) indicated that emotional intelligence plays a role as a moderator of the relationship between cognitive capability and academic performance. A study by Parker et al. (2004) showed that some aspects of EI are predictors of academic

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success. A study conducted by Rode, Arthaud-Day, Rubin, Boomer, Mooney Baldwin & Near (2007) found that EI contributes to the academic success. Newsome, Day&Catano (2000) studied on the relationship between academic success and EI, cognitive capabilities and personality. They used EQi (emotional quiotient inventory) and the study showed no significant relationship. O'Connor and Little's study (2003) found that EI is an unimportant predictor of academic success. Interest in the EI has been increasing rapidly even though disagreements and arguments will probably continue. "While the progress of the emotional intelligence paradigm has been impressive, much remains to be discovered." (Goleman & Emerling 2003). Hence, it is important to adapt this questionnaire to Turkish to investigate the undiscovered areas of emotional intelligence.

Method

2.1 Participants

The sample of this study consisted of 325 university students from Sakarya University, Turkey. Of the participants 203 were female, 122 were male. Their ages ranged between 18 - 30.

2.2. Procedure

The EIRS was translated into Turkish by taking the following steps: Firstly, three specialists translated English version into Turkish. The Turkish version of the EIRS was then translated back into English by two English-speaking language specialists who were blinded to the original scale and the objective of the study. The differences between translated versions were evaluated and a satisfactory compliance with the original scale was achieved by consensus of the translators. The updated version was reevaluated by the original group of expert reviewers, to finalize the Turkish version used in this study. Then the validity and reliability analyses of the scale were examined. In this study, confirmatory factor analysis (CFA) was executed to confirm the original scale's structure in Turkish culture. Besides internal consistency reliability and the item-total correlations were examined. As for the data were analyzed using LISREL 8.54 and SPSS 22.0 package programs.

Results

3.1. Construct Validity

Confirmatory Factor Analysis (CFA) is useful when researchers have clear (or competing) hypotheses about a scale – the number of factors or dimensions underlying its items, the links between specific items and specific factors, and the association between factors. That is, CFA allows researchers to evaluate the degree to which their measurement hypotheses are

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consistent with actual data produced by respondents using the scale (Furr & Bacharach 2008). The results of confirmatory factor analysis indicated that the three-dimensional model was well fit.

(*x^2=357.85,df=132,RMSEA=.0073,NFI=.93,NNFI=.94,CFI=.95,IFI=.95,RFI=.91,AGFI=.8 and*

RMR=.074). Factor loadings and path diagram of Turkish version of EIRS are presented in Figure 1.1

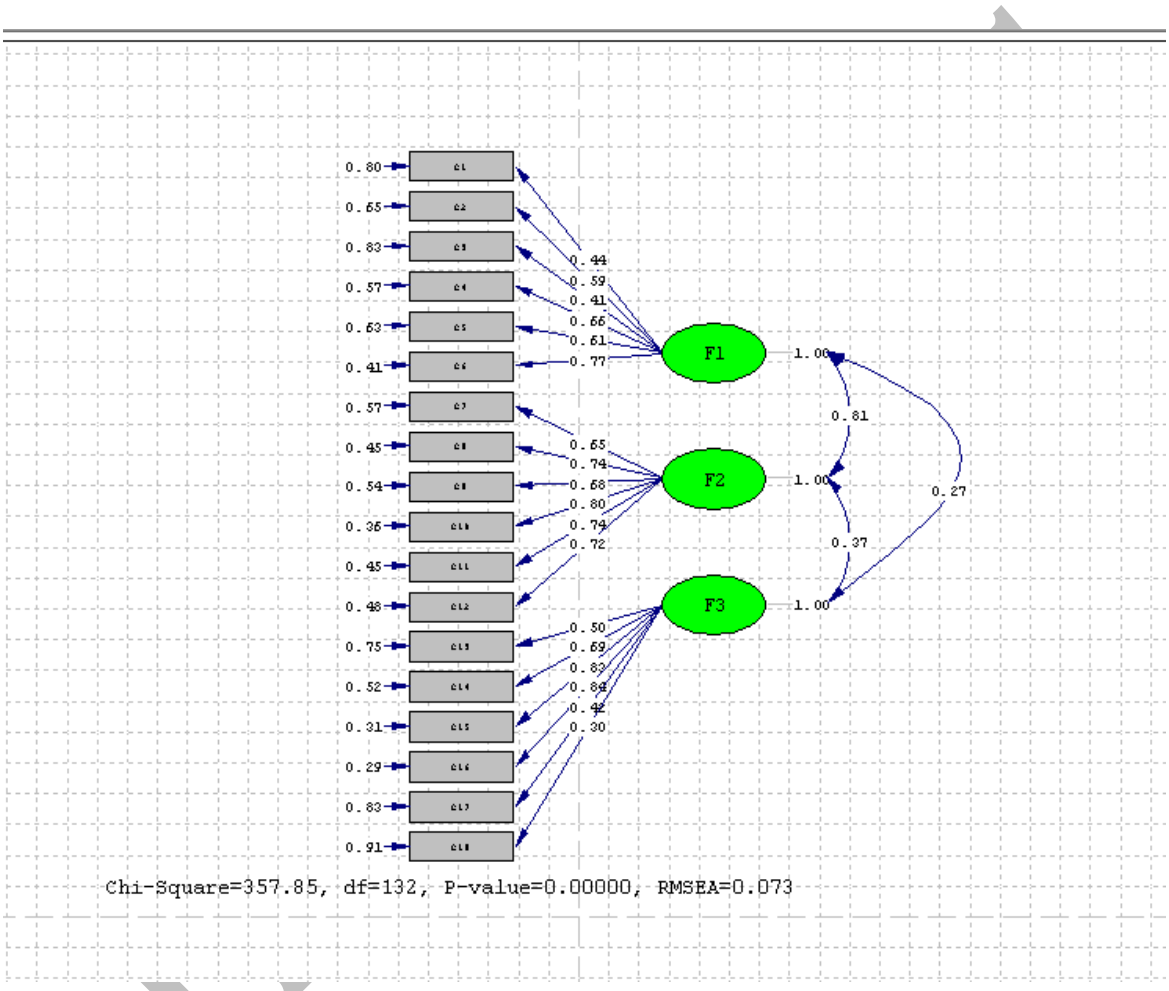


Figure 1.1 Factor Loadings and Path Diagram for the EIRS (F1= Perception, F2=Understanding and F3= Management)

3.2. Reliability

The Cronbach's Alpha internal consistency reliability coefficients of the scale were found as .75 for perception subscale, .86 for understanding subscale, .77 for management subscale and .85 for the overall scale. The corrected item-total correlations of EIRS ranged from .20 to .61. Values for an item - total correlation between 0 and 0.19 may indicate that the question is

not discriminating well, values between 0.2 and 0.39 indicate good discrimination, and values 0.4 and above indicate very good discrimination (Büyüköztürk, 2010).

Discussion

The purpose of this study was to adapt the EIRS into Turkish and examine its psychometric properties. Confirmatory factor analysis demonstrated that the factor structure was harmonized with the factor structure of the original scale. Thus, it can be said that the structural model of the EIRS which consists of three factors was well fit to the Turkish culture (Bentler & Bonett, 1980; Hu & Bentler, 1999; Schermelleh-Engel & Moosbrugger, 2003). The internal consistency reliability coefficients of the scale were high (Büyüköztürk, 2010; Kline, 2000). Considering that item total correlations having a value of .30 (Büyüköztürk, 2010). The results of confirmatory factor analysis demonstrated that the 18 items loaded on three factors (perception , understanding and management) and the three-dimensional model was well fit (*x^2=357.85,df=132,RMSEA=.0073,NFI=.93,NNFI=.94,CFI=.95,IFI=.95,RFI=.91,AGFI=.86 and SRMR=.074*). The present study has some limitations. One of the limitations of the current study is its sample size. In other words, future studies should investigate the same research question with a larger sample size. If a larger sample size clarify some correlations, the validity of the findings can be increased.Moreover, conducting this study in various rural areas of Turkey may represent the generalizability of these results to a wider population. Another limitation of the current study is that the sample was composed of university students, which restricted the generalizability of the findings. Hence, it could be important to investigate the relationship of these variables in other sample groups. Overall findings demonstrated that this scale had high validity and reliability scores and that it may be used as a valid and reliable instrument in order to measure the individuals' tendencies to emotional intelligence. Nevertheless, further studies that will use EIRS are important for its measurement effectiveness.

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'The Case Of The Educated Methodological Study': An Exploration Of Published Technology Related Research Case Studies

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Abstract
This paper reports the findings of a methodological content analysis carried out on a total of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period. Reasons for using the case study approach were identified to be classifiable into one of eight categories and these categories could, furthermore, be grouped according to whether they focused on the nature of, the benefit to be derived from, or how the researcher might engage with, the case study. In considering how the methodological argument of the education based studies compared with those undertaken outside the education sector, there is identification of some favouring of the case study approach within journals publishing education based research; that the boundedness of the study was more likely to feature in education based studies as compared with other research; that the greatest variation between education based and other studies related to the intention to derive theory; and that there was a tendency towards lone working researchers making use of the case study approach within the education sector. Learning arising from this analysis relates to the credibility of using the case study approach for technology related research activity; the targeting of case study research articles toward journals which favour the approach; and the importance of rigor in the methodological explanation.

INTRODUCTION

The case study, as a research method, has a long and respected history which invariably features in the teaching of qualitative research methods to education practitioner researchers. The case study is generally accepted (e.g. Levine, 1996; Langley, 1999; Gephart, 2004; Gerring and McDermott, 2007; Thomas, 2009; Horn, 2009; Lyons, 2009; Welford et al, 2012; Parveen and Mehmood, 2013) to be a single, or limited, study which permits aspects of that case to be studied in depth. Methodologically the case study is described as being "...exploratory, descriptive, and explanatory research without turning to research designs that rely solely on the manipulation of variables" (Morris, 2006 p.140). By embracing what Edmondson and McManus (2007 p.1155) term 'real people, real problems, and real organizations', the case study is argued to be 'the most interesting' as well as offering 'one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research' (Eisenhardt and Graebner, 2007 p.25).

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Many technology related qualitative studies (e.g. Katic, 2008; Carcary, 2009; Sutton, 2011; Evangelista et al, 2013; Harambam et al, 2013; Merat and Bo, 2013; Banerjee, 2014; Beaudry and Gagnon, 2014; Mahzan and Lymer, 2014; Tambo, 2014) identify the pursuit of in depth understanding to be the primary reason for engaging with the approach. Eisenhardt (1989 p.534) explains this in terms of 'understanding the dynamics present within single settings'; what is also described in terms of being the 'how and why' (Leonard-Barton, 1990; Yin, 2014). Depth is achieved through multiple observations; what is on occasion referred to as 'within-case analysis' (Haverland, 2010 p.71).

Each setting, or case, is identified to be a self contained unit of examination; potentially a critical incident (March et al, 1991), the demonstration of a mass of interconnected choices (Siggelkow, 2001). Whilst examination across or using multiple cases occurs, the study of the single case offers the benefits of boundedness, specificity and contextualisation (Stake, 2005; Cohen, 2008). Indeed the presence of boundedness is a factor mentioned in accounts of qualitative technology related research (e.g. Niekerk et al, 2010; Kim and Hannafin, 2011). Boundedness is reasoned to be particularly appropriate when the case has the potential to offer significant insight (Eisenhardt, 1991; Siggelkow, 2007; Eisenhardt and Graebner, 2007). That insight often arises from the researcher having a deep interest in the case being studied, for example where the researcher is both teaching and undertaking research within the same context. The sustaining influence of interest, for example its contribution to stimulating further research activity, is noted (Bartunek et al, 2006). Indeed, the potential interest to be generated by the focal case study is highlighted in the explanation of research methods offered by a number of researchers writing about their qualitative technology related studies (e.g. Staples et al, 2005; Harvey et al, 2012; Hasan and Pfaff, 2012; Aylett, 2013; Harambam et al, 2013; Siyepu, 2013).

The practical elements of undertaking research activity are not overlooked in the research methods literature. Eisenhardt (1989 p.537) cites Pettigrew (1988) as noting, for example, that "given the limited number of cases which can usually be studied, it makes sense to choose cases such as extreme situations and polar types in which the process of interest is transparently observable". Many published technology related studies (e.g. Karlsson et al, 2010; Doganay and Ozturk, 2011; Beckman et al, 2014) have emphasised polarity to be a central feature in their selection of a focal case. Siggelkow (2007: 20) suggests, echoing a view shared by other writers (e.g. Gerring, 2007; Seawright and Gerring, 2008) that selection of a case study becomes appropriate when it permits the 'gain[ing of] certain insights that

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other organizations would not be able to provide'. Indeed many published technology related research studies (e.g. Bencze et al, 2009; Nenge et al, 2012; Breitenbach, 2013; Mellor et al, 2014; Micó and Casero-Ripollés, 2014) place emphasis on the uniqueness of the case they have examined, often explaining their approach using the term 'critical' (Yin, 2014 p. 51).

A practical influence on the choice of case study is the resourcing issue (Stake, 2005; Yin, 2014). This is a concern both for the researcher and for those involved with 'the case', for example the school. The exploratory nature of many studies identifies that much research is undertaken in order to, as Thomas (2009 p.115) terms it, 'understand it in itself'. Stake (2005 p.454) provides reminder that "enduring meanings come from encounter, and they are modified and reinforced by repeated encounter".

Judging by the number of technology related researchers who explain their use of the case study is for exploratory purposes (e.g. Huang and Nakazawa, 2010; Ashworth, 2012; Anand and Monin, 2013; Ferreira et al, 2013; Bani-issa and Rempusheski, 2014; Bezboruah et al, 2014; Jasimuddin et al, 2014; Manresa-Yee et al, 2014), this is a popular approach. Exploratory studies emphasise a theory-building rather than theory-testing approach (Eisenhardt and Graebner, 2007; Gibbert et al, 2008; Greener, 2011; Svenonius, 2012; Yin, 2014) and many published research studies (e.g. Dickey, 2008; Bencze, 2010; Jones et al, 2012; Kuo-Pin and Graham, 2012; Mohlala et al, 2012; Perez et al, 2013; Dmitriev et al, 2014; Hossain, 2014; Sandeep and Ravishankar, 2014) use this theory-building terminology in explaining the methodological approach they have taken. The approach emphasises the development of an underpinning contextual-related understanding, what Dutton and Dukerich (1991 p.519) describe in terms of being 'a focus on issues as a starting point for interpretation and action'. Writing later, Gerring (2004, 2007) picks up on this starting point by highlighting that through incremental progression exploratory studies can lead to generalisation.

Exploratory studies are also reasoned as having the potential to ignite further research activity, contributing to a research momentum. Some technology based research studies (e.g. Carmichael and Farrell, 2012; Ochieng et al, 2014; Webster and Son, 2015) have placed active emphasis on their studies offering future research potential. Roberts and Pollitt (1994 p.528) provide useful explanation in highlighting that, "One case study doth not a comprehensive analysis make, but we hope that it can be illuminative and provocative of further research and discussion". They indicate a momentum that might well be of

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significance in the education sector, especially amongst teaching practitioners, where there is a risk that other professional responsibilities will have a compromising impact on the research momentum. This risk of being distracted from the research task receives focus within the literature (Etherington, 2004; Chen and Anderson, 2008), with some acknowledgement that the distraction might well be related to the practising of the professional discipline (Newbury, 2002; Kingstone et al, 2003; Whiting, 2008).

With the increasing adoption of technology in education, it can be reasoned that consideration of using a technology related case study will have grown in popularity amongst school based practitioner researchers. Even within the limited word count of the academic journal article, some emphasis is placed on the appropriateness of selecting a case study approach. But how does the methodological argument of published technology related case study research within the education sector, publication being reasoned to offer a measure of research excellence, compare with that provided beyond the education sector? Furthermore, what learning can be extracted from this comparison which may add value to future education technology research activities? It is this gap which this paper makes a contribution towards filling.

THE STUDY

A methodological content analysis was carried out on a total of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period. The studied articles were written in English and were accessed using a University-provided 'one stop search tool' which searched 50 databases. Three search terms were used within the abstract filter; case stud*, technolog* and qualitative. The wildcard (*) was used where alternative characters could be substituted e.g. case study and case studies, technology and technological. The retrieved articles were sorted by date, with the commencement date of 2005 and an end date of 2014, ensuring that the analysis was based on complete publication years. The published articles were classified as education or non-education based at the commencement of each analysis activity. For this purpose the title of the journal was the first to be examined. All articles published in an education based journal, for example those with the word (or a derivative of) education within the journal title were classified as education based. The article title was the next to be examined, followed by the abstract, the methodology and then the remainder of the article. The intention was to analyse at least 120 technology based research articles which used a case study approach

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within the education sector and to compare this with the approach used outside that sector. In total 300 technology based research articles which used a case study approach were analysed before this target was reached and the respective year's articles, as retrieved by the 'one-stop search tool', had been considered in their entirety.

The researcher focused on the methodological argument presented. In the main this was captured under a 'methods' heading. However each article was examined in its entirety in order to ensure the robustness of the examination undertaken. Reasons for using a case study approach, where provided, were gathered and analysed using an open coding approach.

DATA AND FINDINGS

The body of 300 technology related research case studies which used a qualitative methodology and were published during the 2005 to 2014 time period were drawn from a total of 231 journals. Those articles which had an education basis were drawn from 79 journals, with 32 percent of those journals seen to have published more than one article which met the search criteria. Non-education based articles were drawn from 152 journals, with 23 percent of those journals seen to have published more than one article which met the search criteria.

Over the studied time period there was an increase in the publication of technology related research case studies using a qualitative methodology. Whether this is the consequence of increased use of the approach per se, or increased favouring of the approach amongst those reviewing the research articles prior to publication, cannot be determined from this data. However, as illustrated in Figure 1, there was a significant increase in the use of the approach both within and outside the education sector between 2010 and 2012. Whilst latterly this tailed off within the education sector to a rate which appeared to be more in line with that seen during the 2007 to 2010 period, as at the end of the studied period use still appeared to be increasing outside of the education sector.

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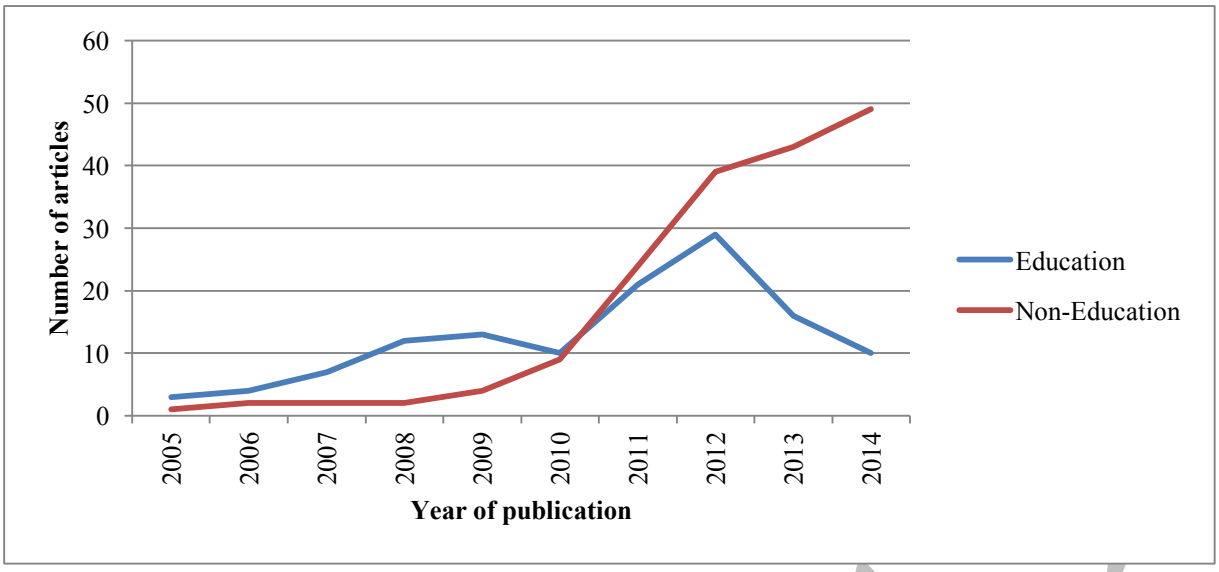


Figure 1: Published technology related research case studies using a qualitative methodology

Not all researchers are seen to have specifically identified in their article their reason for choosing the case study approach. Indeed, in total 42% (n=52) of the examined education based research articles and 38% (n=66) of the non-education based research articles failed to specifically identify why they had selected the case study approach for their research activity. Furthermore, for a significant part of the studied period, notably 2007 onwards, a measure of consistency in failing to identify this reasoning is identified both inside and outside of the education sector. In the case of the non-education sector, this amounted to 48% of the articles published between 2007 and 2014 failing to provide an explanation as to why a case study approach had been chosen. This is compared with 42% in the education sector.

Whilst this lack of detail might indicate a less than robust approach has been taken in providing detail for those seeking to examine the researchers' respective studies, further examination of the articles identified some inference to have been provided. Researchers might have intended that this inference should be used to rectify the identified gap. Illustrating this, seven examples drawn from the education sector were identified as drawing on cases where the researchers were already working with their studied student grouping, thus indicating that their studied case was both convenient and accessible. Some acknowledgement of this accessibility issue was also identified as being inferred in articles drawn from outside of the education sector.

'Already working with the studied case', and thereby having convenient access to data, was also noted to be a feature where explanations *were* specifically provided as to why a case

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study approach had been chosen. Fourteen articles mentioned already having access to the case study organisation. There did not appear to be any time related trends, although the approach was seen to receive some favour in articles published in 2012. The approach was, however, identified to be favoured by lone working researchers, with all but one (non-education) article citing this approach having been written by a single researcher. The single researcher tendency is in contrast to the aforementioned articles which simply provided inference that it was the convenience of working with the student grouping which accounted for their choice and where 57% of the articles were written by two or more researchers.

Where reasons for choosing the case study approach were identified, namely in 58% (n=73) of the education based articles and in 62% (n=109) of the non-education based articles, the principal reason fell into one of eight categories; the aforementioned accessibility of the data (by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. In that examination open coding was used, with the categories derived from the phraseology present in the articles. Identified from those categories was that the provided explanations focused on one of three elements; the nature of the case (for example in relation to polarity), what might be the benefit of the case (for example with regard to a desire to derive theory) and how the researcher might engage with the case (for example that it offered exploratory potential). Also identified was that some of the terms used in the explanations were loosely applied, for example 'derive theory' might well have been associated with 'refining theoretical proposition and develop grounded hypotheses' as one non-education article published in 2014 highlighted, but it appeared to often be used to simply identify a desire to generally enhance understanding; what might be termed 'theorising'. In contrast, other researchers who appeared to be theorising were seen to have used the simpler 'exploration' term. Thus whilst eight categories were identified, the way they were applied suggested that some blurring in the terminology being used may have occurred. The importance of this study having therefore considered the full article, and having focused on the principal reasoning offered, was thereby identified.

The accessibility of the data already having been discussed, each of the remaining categories are now examined:

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Study boundedness

The boundedness of the study was identified as the least frequently used explanation for choosing a case study approach, being the central focus of just 4% of the explanations provided. This reasoning was marginally more likely to be associated with an education based study (63%), than outside this sector. No more than one article per year in either sector was identified as having provided this explanation and no less than two researchers were associated with any of the articles.

In order to derive theory

Explaining use of the case study as being associated with efforts to derive theory accounted for 17% of the explanations provided. Although this 'in order to derive theory' reasoning was used by 10% of education based articles which provided an explanation, and 6% of all the education articles sourced, outside of the education sector the approach was more popular. The 'in order to derive theory' explanation was used by 22% of non-education based articles which provided an explanation for use of a case study with, as seen from Figure 2, a general trend toward increasing use being made of this reasoning over the studied time period. Within the limited body of the education articles using this reasoning, 71% were written by lone researchers. This contrasts with 8% of lone researcher work outside the sector. Here, a two person team accounted for 50% and a three person team accounted for 29% of the articles citing the intention to derive theory.

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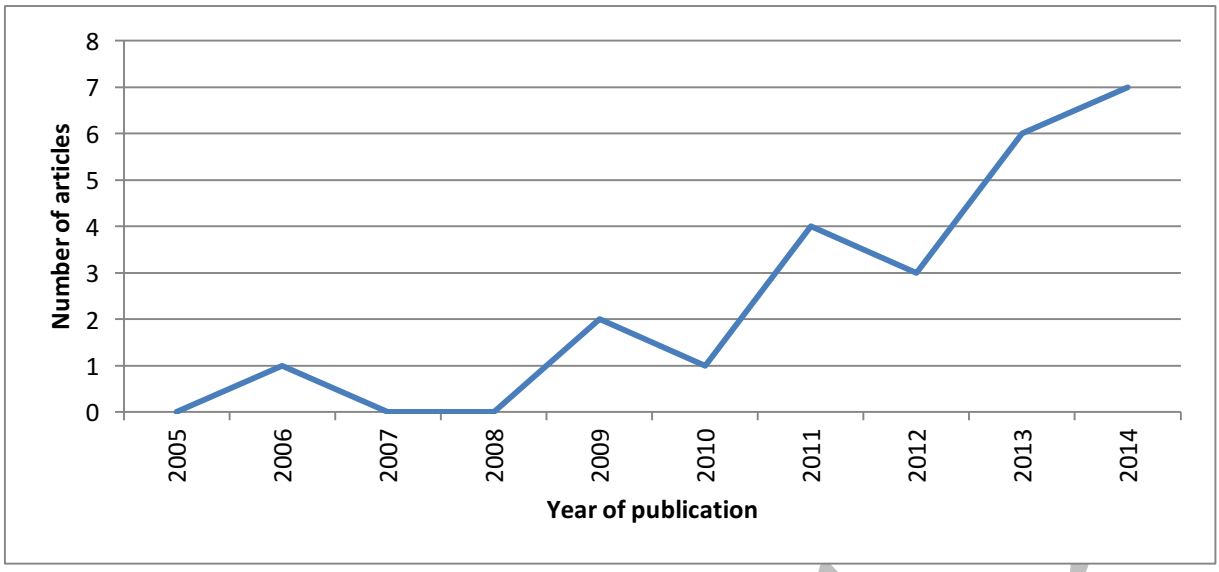


Figure 2: Published non-education based technology related research case studies which explain a case study approach had been chosen to facilitate the deriving of theory

The case study's exploratory potential

The potential of the case study to facilitate exploration accounted for 32% of all the case study use explanations provided. Overall, there was a measure of consistency between the use of this reasoning in education sector articles (33%) and non-education articles (31%). However, as seen from Figure 3, there was variation in the use of this explanation over the studied time period, with the favouring of this approach within the body of education related articles decreasing following a peak in 2011. Outside the education sector, and since 2009, there has been a general trend towards increasing use of the approach. The approach appeared to be favoured where there were multiple researchers associated with a study, with 79% of the education and 82% of the non-education research articles examined citing the exploratory reasoning for using a case study approach, having two or more writers.

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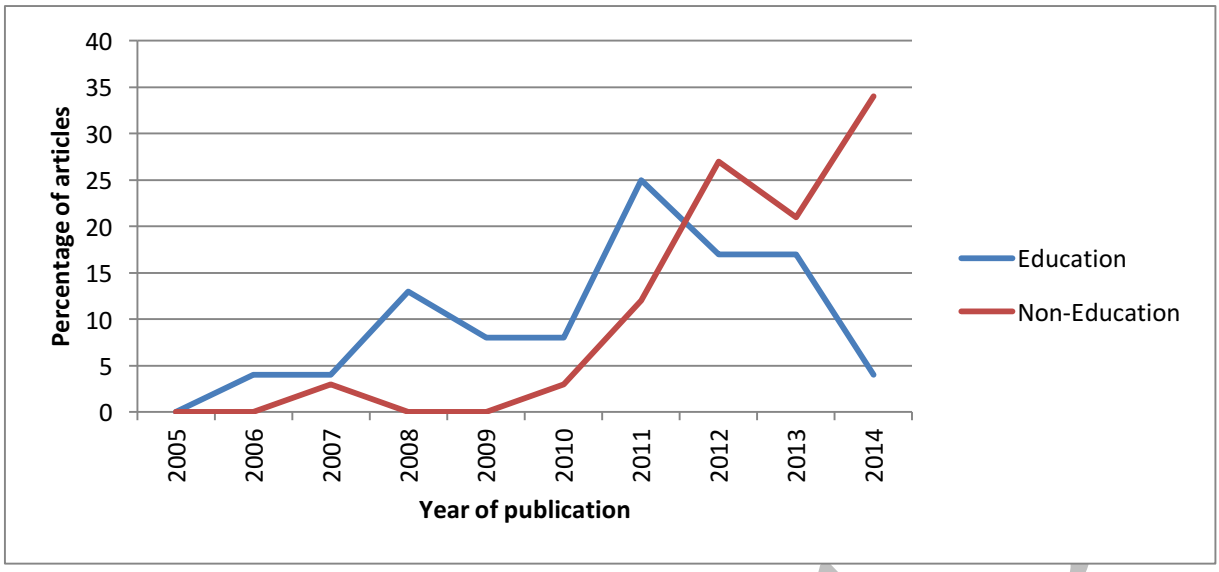


Figure 3: Percentage of published articles citing the potential of the case study to facilitate exploration

Studying phenomena in depth

Use of the argument that the case study approach permitted one or more specified phenomena to be examined in depth was used in 14% of the articles where an explanation was offered. This figure was likewise reflected when considering the percentage of explanations featuring this reasoning within, and outside, of the education sector. However, whilst the approach was seen to have had consistent, but limited, use in education based research throughout the studied period, until 2011 little use was made of the 'studying phenomena in depth' reasoning outside of the education sector. Since this point it has become increasingly popular. With just two exceptions when the approach was used by either a two person or three person writing team, it has been single researchers carrying out research within the education field who appear to have favoured using the 'studying phenomena in depth' explanation. This is in contrast to the non-education sector where 73% of the articles using this argument were from multiple writers; there being in one case as many as seven contributors.

Polarity of the cases

Behind the 'boundedness of the study' reasoning, the polarity of the examined cases was the least popular explanation for use of a case study approach. It did, nevertheless, account for almost 6% of the explanations provided; this being 4% and 6% of the explanations within the education and non-education sectors respectively. Limited use precluded identification of any arising trends, although it was seen that little use was made of the polarity argument before 2010. Furthermore and, in view of the limited number of studies citing this reasoning

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when considering both sectors together, there appeared to be equity of use of the approach across the researcher group sizes, extending from the lone researcher to a writing group of four. This largest group of researchers completed their study outside of the education sector.

Studying phenomena in a specific environment

An argument that the case study permitted the studying of a phenomenon in a specific environment was provided in 10% of the articles offering an explanation for case study use. In comparison with the non-education sector where it was offered in 7% of the provided explanations, use within the education sector was more significant. This said, the 14% of provided education research based explanations which made use of this reasoning, was significantly less than that which argued the case study facilitated exploration (33%). Whereas the eight examples identified from non-education sector research were distributed evenly across the years 2011 to 2014, the education sector tended towards a more consistent use of the approach over the examined 10 year period. Furthermore, in contrast with a tendency towards small researcher group writing, studies citing the potential to study a phenomenon in a specific educational environment were identified as having been written by groups of two, three or four writers. Additionally, there was one education based article prepared by a group of seven researchers. The non-education sector took a similar approach; an approach not dissimilar to that seen in other categories such as where it was reasoned that a case study approach was taken in order to study a phenomenon in depth.

Uniqueness of the case

Ten percent of the explanations offered for using a case study approach were encapsulated within a 'unique or interesting case' categorisation. This amounted to 6% of education based articles, compared with 13% of non-education based research. It might be questioned whether this is reflective of the nature of education based research with regard to equity of educational opportunity and thus provision. The limited volume of education related studies precluded significant trends being identified but it was seen that the number of researchers contributing to those education based studies was never less than three in number. In contrast, the non-education sector research articles tended towards smaller group writing with 50% of the articles written by a lone researcher. The significance of this data is apparent in the light of the number of non-education based studies where collaborative writing activity was apparent, as seen in Figure 4. Furthermore, and as also seen from that figure, the published education based studies appeared to favour smaller numbers of researchers collaborating on any one

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study for the purpose of academic writing; usually 3 or less individuals. Education context researchers appeared to be more likely to be lone writing researchers than their non-education contemporaries and less likely to participate in large group (5 or more researcher) writing activities.

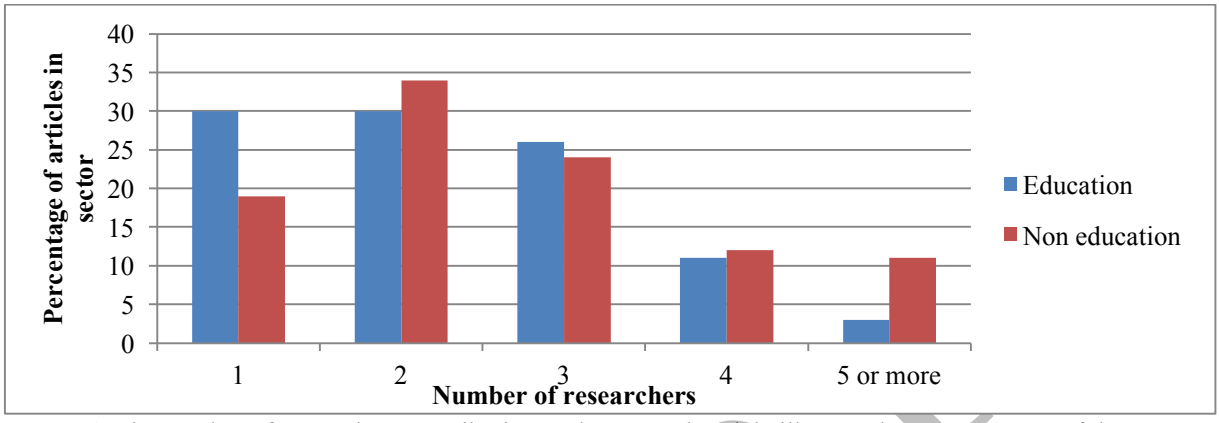


Figure 4: The number of researchers contributing to the research article illustrated as a percentage of the case study research articles published within the respective sector

DISCUSSION

Potentially serving to perpetuate its long and respected history as a methodological tool, this study has identified the case study approach to be regarded as an appropriate tool for use in publishable technology related research. Thus it is reasoned that a favouring of the use of the case study approach should not preclude the researcher from achieving publication status. However, whilst the case study approach might be being actively used, the distribution of the 300 related articles amongst 231 journals brings into question the popularity of the approach and suggests that the case study using researcher might wish to target their work toward the interests of the publications which have previously demonstrated a favouring of the use of the case study. This study identified that 79 journals had published 125 education based technology related research studies which made use of a case study approach. Whilst the nature of education research is likely to result in the education researcher focusing on education based journals, in the light of increasing interest in the case study method for technology related studies outside the sector, there might well be merit in considering an extension of the trawl of potential journals to include those beyond the education based boundary. This extended approach might also serve to exemplify the nature and relevance of research undertaken within the education sector and thus additionally fulfill a profile raising function.

Not all researchers specifically state their reason for using a case study mechanism, and

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this appears to be an increasingly popular approach both within and outside the education sector. By the researcher failing to provide this detail the reader might well be being forced to engage in speculative activity. Furthermore, whilst this speculative role might be based on reasoned assumptions, potentially fuelled by reflection on what other detail is provided within the article, there remains a risk to the article's message; the researcher's intention of conveying findings or argument, and thus adding to the body of knowledge, being central to the publication endeavour. The researcher might be well advised to be proactive in seeking to close this gap with case study detail offered within a methods section.

Further compromise in the contribution offered by an article may arise as a consequence of the variance identified in this study of the meaning associated with the terms used; again a factor apparent both within the education sector and spanning that sector's boundary. It is reasoned that since this variance is identified within the published material using the same language, English, the compromising impact of liberal application of terminology risks being all the more pronounced when English is, for the reader, a second language. Since researchers have an obligation to convey their findings, and thus their contribution to the body of knowledge, with integrity; an awareness of, and effort to mitigate, the potential for variance should feature as part of their method considerations.

Reasons for using the case study approach were identified from the case studies examined to fall into one of eight categories - accessibility of the data (by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. Some parallel here with, and by way of example, the aforementioned 'exploratory, descriptive, and explanatory' terminology used by Morris (2006 p.140), 'critical incident' terminology used by March et al (1991) and 'boundedness' term used by Stake (2005) and Cohen (2008) in describing the case study, together with the debate surrounding interest generated by Eisenhardt and Graebner (2007), is evident.

Since the categories, through a process of open coding, were derived from the phraseology used in the articles, it appears that the respective researchers not only possessed some familiarity with the arguments presented within the research methods literature but that they

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were also desirous of embracing the sentiment of this literature within their research practice. Whilst this scenario appears to be positive, a desired state, and might be the consequence of the approach taken to the teaching of research methods, it is an approach that may account for the identified loose application of terminology and thus some compromising of clarity. The aforementioned example of the breadth associated with the 'deriving theory' explanation of case study use is an example. Furthermore, it was also identified that there was some variance in the frequency with which these categories featured as well as there being a variance between the education sector and non-education sector with regard to categorisation. Offering insight, not least because of the clarity it offers in the presence of the potential for a blurring of cited categories, is identification that the provided explanations tended to focus on one of three elements; the nature of the case, the potential benefit of the case and how the researcher might engage with the case.

It is acknowledged that the nature of the study might well have been of influence with regard to comparison of a defined (education) environment as compared with the context of a broader range of technology related studies using a case study approach. The literature was noted not to have overlooked the practical elements of undertaking research activities. 'Study boundedness', the opportunity to study 'phenomena in a specific environment', and to a lesser extent the 'polarity of the cases', all have the potential to be influenced by the reality of the education environment, noting there to be a general influence on the researcher to work with the material which is available to them and that the appropriateness of any case study choice is linked to the potential for deriving insight.

What might initially be perceived as being the lesser valued case - as a consequence of being, for example, commonplace - might prove to offer significant insight or impact. The case has the potential to offer what Dutton and Dukerich (1991 p.519) term the 'starting point for interpretation and action'. This is the consequence of the feasibility of undertaking the research task and associated activities, such as the potential to 'return' to the studied environment for the purpose of achieving clarification or additional data. Multiple observations offer the potential for 'within-case analysis' (Haverland, 2010 p.71). The researcher may have a particular interest in the case being examined as a consequence, for example, of it being both the researched and teaching environment. Regardless of whether the bounded term is specifically used, the sentiment behind such an approach within an educational setting encapsulates what Edmondson and McManus (2007 p.1155) term 'real

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organisations' and may go some way to explain why, for example, boundedness has been found to be marginally more likely to feature in education based studies as compared with other research. It would be speculative to suggest that the potential for the case study to be perceived by others as being of lesser value may have contributed to some researchers avoiding the inclusion in their article of a specific statement of their reason for using a case study approach, nevertheless this remains an avenue for exploration.

The nature of the environment available for examination can also be reasoned to explain why it is more likely that lone working researchers will undertake education based research using a case study approach, as compared with other sectors. In the absence of the influence of a team effort, increased reliance is placed on inherent motivation and some of that motivation may arise from an 'in situ' examination within, for example, their teaching environment. Whilst ensuring the integrity of the data, consequent to potential influence exerted by the researcher's presence, is a prerequisite, and reasoned to feature amongst ethical considerations, through the elimination of distance the influence of distraction might be mitigated. That distraction might well be related to the practicing of the professional discipline is noted within the literature (Newbury, 2002; Kingstone et al, 2003; Whiting, 2008). Research momentum, furthermore, has the potential to ignite further research activity.

CONCLUSIONS

The intention of this paper was two-fold. Firstly, how it sought to identify how the methodological argument of published technology related case study research within the education sector compared with that provided beyond the education sector. Secondly, it sought to identify what learning can be extracted from this comparison and which might add value to future education technology related research activities.

In relation to publication of technology related research case studies using a qualitative methodology within the education sector, as compared with other sectors, the data gathered from the 2005 to 2014 time period identified there to be journals which favoured use of the case study approach and that this appeared to be more significant amongst studies with an educational underpinning as compared with those outside the education sector. Furthermore, the study highlighted there had been a general increase in the publication of technology related studies underpinned by the use of the case study although with regard to education

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based research, following a peak in 2012, there has been a return to a level equating to the 2008-2010 period.

Not all writers stated why they had selected a case study approach; a practice showing some commonality across the education sector boundary. However, where reasons for using a case study approach were provided, the meaning associated with the terminology which was used varied. This variance was a factor both within and spanning the education sector boundary. This acknowledged, and using the detail which accompanied any provided reason for the purpose of clarification, those reasons were capable of being classified into one of eight categories - accessibility of the data (for example by already working with the studied case); the boundedness of the study; in order to derive theory; the exploratory potential; that the case offered the potential to study phenomena in depth; polarity of cases; that the case offered the potential to study phenomena in a specific environment; and that the case was unique or demonstrated factors of particular interest. Furthermore, where reasons for using a case study approach were provided, and taking the studied ten year period as a whole, the least likely reason for using the approach was because the case study was bounded, although this appeared marginally more likely to feature in education based studies as compared with other research. The most popular reason related to the case study offering exploratory potential. Here there was a measure of consistency between the use of this reasoning in education sector research (expressed in 33% of articles) as compared with non-education articles (31%). The greatest variation between education and non-education based studies occurred in relation to a desire to use a case study in order to derive theory. Here just 10% of education based research which provided reasoning for using the case study approach, as compared with 22% of non-education related articles, indicated an expressed intention.

Lone working researchers were more likely to be found undertaking education based technology research using a case study approach, as compared with other sectors. However the reasons for using a case study approach, both within and outside the education sector, are identified as being related to the nature of, the benefit to be derived from, and how the researcher might engage with, the case being studied.

In relation to the learning which can be extracted from this comparison, the case study approach has been identified as being regarded to be appropriate for use in technology related research activity and simply choosing to use the case study approach should not preclude the

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researcher from achieving publication status. The case study is, therefore, a method which the education based researcher might wish to consider as they plan their technology related research activity using a qualitative methodology. However, whilst many journals were seen from this study to have accepted for publication technology related research articles which made use of a case study method, the more limited popularity of the approach indicates that the researcher might wish to target their work toward the interests of the publications which have previously demonstrated having favoured use of the case study approach and this need not be limited to those journals within the education sector. Furthermore, this approach might serve to exemplify the broader relevance of research undertaken within the education sector and thus additionally fulfill a profile raising function.

Failure of the researcher to specifically state their reason for using the case study method and/or the meaning associated with the explanatory terms used, risks engaging the reader in speculative activity. Since speculation risks both detracting from the message being conveyed and undermining the integrity associated with the researcher role, the researcher might be well advised to be proactive in seeking to close this gap through the detail offered within their study's methods section. The favouring of active use of terminology used within the research methods literature is apparent and has the potential to offer a benchmark for understanding. Furthermore, the researcher might find it helpful, in the formulation of their research framework, to identify whether it is the nature of the case, the potential benefit of the case or how they, as the researcher, might engage with the case, which is of significance.

Whilst insight into the case study being examined will aid the researcher's clarity in providing the methodological argument, the educational based researcher should not be surprised if in reasoning their approach there is variance with the argument used in other technology related research activities; particularly when compared to activities occurring outside the education sector. These differences might well be the consequence of the examined context and the potential, for example, for practitioner researchers to be both researching and teaching in the same environment.

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The Constraints That Can Be Observed In Improving The Quality Of Higher Education Graduate Especially In Engineering

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Abstract
In Indonesia efforts to make engineering students have the desired competencies in engineering mechanics is a complicated issue, so that the competence of engineering mechanics does not always meet the standard criteria. The profound and immensity of learning materials obviously are cumulative and integrative, started from elementary school up to higher education in accordance with the selected path. Engineering mechanics is a new material that is not in the curriculum of primary and secondary education, but the basic knowledge needed already exists in the physics. The results of study showed the mastery of basic sciences such as Physics was limited to students of elementary and secondary schools. These issues have led to a longer study in higher education. Engineering Mechanics are the beginning competence to be possessed to succeed in getting the next competencies to become engineers or scientists. The issue is one of the constraints that must be resolved since elementary to high school level. Meanwhile the standard of academic performance indicators has not graduates competence indicator, made it difficult to be sustainable educational process as desired.

Keywords: basic sciences, competence, engineering graduates, engineering mechanics, Indonesia

INTRODUCTION

Higher education of engineering is one of the concerns of developing countries to improve the advancement in technology. Countries with a large population want to have a high enough technological capabilities in order to meet his own needs that are always increasing. Human life that more and higher quality can only be met by increasing the use of science and technology. Science and technology used in industries that produce products to meet the needs of everyday life. Science and technology is necessary also for agriculture, housing, infrastructure, transportation and others. From this kind of thinking, that higher education of engineering should be prepared to meet the needs of technical personnel skilled minimum to meet the interests of their own country in order to avoid dependency on other countries.

Efforts to make engineering students have the desired competencies in engineering sciences (C4AIEA, 2014) are a complicated problem. It often happens alumni of higher education do not have the technical competence that meets the standard criteria. It is known from the fact that the alumni unable fulfilled jobs engineering work which is offered, while quite a lot of engineering graduates.

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OBSERVATION OF THE PRIMARY SCHOOL TO HIGH SCHOOL EDUCATION

The depth and breadth of learning materials obviously should be cumulative and integrative (Kepmendiknas, 2014 ; IQF, 2012) started from primary school, secondary school to higher education according to the selected path. If there is a shortage of learning materials mastery abilities (competencies) at basic levels, longer needed extra time to understand the factual knowledge that can be applied to the engineering knowledge to achieve the desired level of competence.

One example of engineering knowledge is engineering mechanics. Engineering mechanics is a new material that is not in the curriculum of primary and secondary education, but the basic science and factual knowledge required for this has been included in the curriculum of primary and secondary education.

The results of study showed mastery of basic science is only limited at knowledge level from elementary school students (Surya, 2007) to high school. This resulted in students' reasoning ability is very low. In higher education with low reasoning ability resulted in study time becomes longer and less mature mastery. Engineering Mechanics in engineering study programs are beginning to be possessed competence to be able to succeed in getting the next competencies to become engineers or scientists.

Meanwhile the standard of academic performance indicators which are government policies to improve the quality of education has not led to the indicator of the competence of graduates. This makes it difficult to be sustainable educational process as desired from elementary school to higher education.

Change Of Learning Atmosphere Between Elementary, Secondary And High Scholl To Higher Education

Primary and secondary education in Indonesia takes 12 years. A long time like this will generate naturalization in student learning. Different learning process conditions will complicate the student after admission in the college. Two difficulties will be faced by students after admission in higher education, low reasoning ability and different habits learning process.

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The above issues can be solved if the policy changes concerning education is based on the results of extensive research (Utomo, T. and Ruijter, K., 1989), not only based on theoretical studies. The policy change from the results of the theoretical ideas cause a lot of resistance in its implementation due to incompatible with the initial condition that has been going on in the community. Initial conditions are basic fundamentals as the basis for the mutable.

To overcome two difficulties mentioned above some institutions do repetitions basic learning model in the first year (ITB, 2013). The first year consists of two semesters is quite capable of bringing change habits, but it remains a big loss because of the continuity of education cannot run smoothly. The results achieved are not as good as when the period of 12 years of elementary and secondary studies is already a reasoning model and not promoting cognitive domain.

RESEARCH OF BASIC CAPABILITIES THAT MUST BE MASTERED

Simple studies in class to know the basic capabilities and the ability reasoning shows that students demonstrate mastery and reasoning abilities of the basic sciences that should have been mastered from elementary to high school level only achieve 20%. Examples of partial results are shown in Table 1. The study was conducted by providing pre-test and post-test on the implementation of learning courses. Problem is made equivalent to the capability at the high school level with the material problems associated with learning material subjects concerned.

Table 1. Mastery evaluation Natural Science and Basic Science

No.	Tested on courses	Percent reasoning ability and mastery of natural science and basic science necessary
1	Concrete Structures	16.14 %
2	Analysis Structures 1	23.08 %
3	Analysis Structures 2	16.67 %
4	Steel Structures	12.90 %
5	Engineering Materials	32.50 %
	Average	20.26 %

Table 1 shows the incapability in reasoning abilities of students to basic and natural science.

CONCLUSION

Simple research from learning activities faced everyday and the above discussion, to accelerate the completion of engineering studies in higher education and produces graduates with competencies that meet the standards, required experience reasoning abilities from elementary school to high school student of the natural sciences and basic science. With the

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factual knowledge possessed and good reasoning ability, will make it easier to get competencies in higher education engineering.

Reviewing curriculum in elementary, secondary and high school is sufficient to keep learning in higher education as a basic to get the desired competencies. The level of reasoning must be very good which can only be obtained since the start of primary school.

Policy changes in the concept of learning should be based on good research results so that the models that appear can be applied correctly in accordance with the existing conditions.

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The Effectiveness Of Physics PTechLS Module In a Rural Secondary School In Malaysia

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Abstract
The PTechLS module combines learning styles with the use of technology to increase students' learning experience, especially in learning abstract concepts. The PTechLS module prototype was developed by Norlidah Alias (2010). The aim of this study is to evaluate the effectiveness of the implementation of the Physics PTechLS module in a rural secondary school in Malaysia. The PTechLS module was implemented from year 2012 to year 2014. The study adopted the exploratory implementation design which incorporates a quasi-experimental research design. 15 students agreed to participate in this study. In addition, a retrospective usability evaluation of the the implementation of thePTechLS module, with two Physics teachers as the users was conducted. The findings of this study showed that there were significant difference in the pre-test and post-test scores. This indicates that students' achievement score could improve after using the Physics PTechLS module. The interview with the teachers showed that the Physics PTechLS module could be used as a resource. In addition, further improvements of the PTechLS module were suggested. Hence, there is possibility that the Physics PtechLS Module could be used in other secondary schools in rural areas in Malaysia to improve students' achievement and interest in Physics.

Keywords: Physics education, Exploratory implementation design, Learning Styles, Technology.

INTRODUCTION

The global learning landscape of the twenty-first century is being transformed and shaped by the uptake of digital communication tools and online-networked applications, along with the changing characteristics, needs, and demands of students. Learning is also shifting toward more self-directed, self-regulated learning, supported by the socially based tools and technologies of the Web 2.0 movement (McLoughlin & Lee, 2010).Teaching strategies that try to match learning styles with a particular technology can enhance the learning experience of students (Norlidah Alias, 2010; Norlidah Alias & Saedah Siraj, 2012; Norlidah Alias, Dorothy DeWitt, & Saedah Siraj, 2013).

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Students receive and process information in different ways, which means that they have different learning styles or preferences (Felder & Spurlin, 2005).In addition, identifying the unique learning styles of students is essential to ensure that students are engaged in learning (Graf, Kinshuk, & Liu, 2009; Larkin-Hein & Budny, 2001; Yang and Tsai, 2008; Aimie, Siraj Ahmad Abuzaid, & Shagholi, 2010). Specifically, active-style learners prefer to be engaged in teamwork. Such learners learn new information well through actively discussing, applying, working together and explaining to other learners. On the other hand, reflective learners absorb the new information better by independent working, thinking of the question, quietly studying. Learners with sensing or intuitive learning styles perform better by leveraging learning materials with more examples than theories. Sensing-style learners understand better if the new information can be connected to their past concrete experiences and daily lives. It is hard for sensing-style learners to understand abstract concepts. On the other hand, intuitive-style learners have the ability to comprehend abstract materials and they are more creative than sensing-style learners. They dislike learning materials that give away too many details (Wong, L-H & Hsu, C-K , 2014).

Therefore, this study found that when the instructions given by the teacher is in line with students' learning styles, student achievement will increase along with motivational and affective components (Aviles & Moreno, 2010; Franzoni & Assar, 2009; Lau & Yuen, 2010 ; Saeed, Yang, & Sinnapu, 2009). Learning style is defined as how a student tries to concentrate, process and retain information during a learning process (Dunn, 1990).

Past studies showed that matching specific topics in Physics to technology and learning styles can enhance students' grasp of a concept (Hein, 1997; Ross & Lukow, 2004; Tsoi, Goh, & Chia, 2005). Physics pedagogical module (PTechLS) used in this study was developed by Norlidah Alias (2010) to enhance learning of abstract concepts in physics by matching learning styles with the right technology. This module is then carried out to 120 students in schools in urban areas in the Klang Valley (Norlidah Alias & Saedah Siraj, 2012) involving 30 students of every learning style (visual / verbal, active / reflective). The results of this study suggested that this module is effective for students of visual learning style, active, reflective but less suitable for verbal students. Researchers also compared the effectiveness of Physics module according to gender. The findings show that the Physics module is suitable for students with oral and reflective learning style is effective for female students, but less

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suitable for male students. This module is then extended and implemented in a rural school in Negeri Sembilan, a state in Malaysia.

This article will focus on the effectiveness of the PtechLS Physics module to improve student achievement in a Felda Learning Center in the Jempol district, Negeri Sembilan. PTechLS Physics module has been implemented for two years from 2012 to 2014. In addition, the usability evaluation was also carried out involving two physics teachers who are involved in the implementation of the PTechLS module.

A study conducted by Rashidah Rashid (2007) found that the most dominant learning styles in the rural areas students is auditory, followed by kinesthetic and visual. The study also showed a significant relationship between rural students' learning styles and motivation. The findings of this study differ from Azizi Yahaya and Nurfaizah Abdul Majid (2011), which shows that the most dominant rural students' learning styles is visual. The study also found that there was a significant relationship between learning styles and achievement in rural areas students.

In addition, previous studies also showed that academic achievement was associated to students' learning styles. According to Wan Zuraida Wan Hamid (2002), there are a variety of learning ways such as to understand, discuss, self-learning, group learning and so on. Each individual has their own learning style. Therefore, excellent students have their own effective learning styles.

Studies conducted by researchers within and outside the country similarly highlighted the effective use of technology to the learning styles to improve student achievement, particularly in rural areas. For example, a study by Hazura Mohamed, Hairulliza Mohamad Judi, Siti Fadzilah M. Noor and Zawiyah M. Yusof (2012), shows the level of ICT among rural students is low but the mastery of basic ICT skills is moderate. Thus, the efficiency of teachers to adapt the use of technology with students learning style could improve students' achievement.

However, the study by Lai (2008) showed a lack of opportunities to use ICT becomes a barrier to access digital services among students in Malaysia, especially in rural areas. The findings show that students lack with digital skills due to the technology that is non user-friendly, less ICT training and social support services.

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THE STUDY

The aim of this study was to evaluate the effectiveness and usability of PTechLS Physics Module to improve students' achievement in Felda Learning Center in Jempol District in Negeri Sembilan. This study aims to answer the following research questions:

• Do PTechLS Physics Module effective in improving achievement among Grade 10 students?

• What are the teacher's perspectives on usability of Physics PTechLS Module to Grade 10 students?

SCOPE AND LIMITATIONS

In this study, the samples were 15 students in rural secondary school in Negeri Sembilan. In this study only one topic in Physics has been designed in the PTechLS Physics module for Grade 10, entitled "Gas Law". This topic has been identified as a topic involving abstract concept which is difficult for students to understand. The scope is over two learning styles namely, active and reflective. This study is limited to only one rural school in a district in Negeri Sembilan and the findings can not be generalized to other schools in Malaysia.

METHODS

In this study, the quasi-experimental design with a group (treatment) was used. The selected school is from rural areas in Negeri Sembilan; mostly inhabited by FELDA (Federal Land Development Authority) settlers children from nearby villages, and has been proposed by FELDA Education Unit. Treatment group (n = 15) were exposed to pre-test before learning using PTechLS Physics Module under the topic "Gas Law" in the subject of Physics Grade 10 for two weeks. Prior to that, students were grouped according to their learning style after they sat for the Learning Style Index test (proposed by Felder-Silvermen).

Modules and instruments to measure the pre- and post-test have been developed by an expert in physics education. Physics module comprises of learning activities which is supported by the linkage (WebQuest, Youtube) corresponding to the learning styles of the students. Post-test has been carried out to the top students a week after the treatment was given. Data were analyzed using SPSS and t-test was performed.

In addition, assessment on PeccLS Physics module from teachers retrospective was determined by interviewing both the teachers using semi structured interview protocol, two weeks after the implementation of the module. The interview was transcribed and cross-checked by both of the respondents

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INSTRUMENTATION

Instruments used include pre- and post-test, semi structured interview protocol to get feedback on the userbility of the module. Pre and post test were designed to assess whether the objective of the production of the module is achieved.

RESULT AND DISCUSSION

T-test (One-Sample)

T-test (one sample) was used to compare pre- and post-test scores of students who have used PtechLS physics Module.

Table 1: t-Test of Grade 10 Students Physics Score

Constructs	Test	N	Mean (M)	Standard deviation (S.D.)	t- Value	Significant
Grade 10 Physics students	Pre Test	15	55.73	4.13	37.14	0.00
	Post Test	15	76.53	7.9		

* Significant at p <.05

t- Test (one sample) that have been undertaken to compare the Pre and Post Test scores after PTechLS physics module implementation shows that there is a significant distinction in the pre-test scores (Min = 55.73; S. D = 4:13) and post test (Min = 76 , 53; S.D = 7.9; t (df) = 37.14, p <0.05). This indicates that the PtechLS Physics Module execution effects the students achievement.

Retrospective evaluation of Physics Module PtechLS

Transcription of the interview with the two teachers using Module PtechLS Physics was analyzed based on the emerging themes. The results show that these modules provide opportunities for students to master abstract concepts in physics and increase their interest in learning physics based on their learning styles respectively.

Suitable for different types of students

Both the physics teachers were satisfied with the implementation of PtechLS Physics Module because it provides space and opportunities for students to learn according to their own learning style.

From the analysis of the interview, Teacher A explains that:

"It is a very good program. It can consider all the different learning styles of students which teachers always overlooked. This module assists in the delivery of instruction for different types of students"

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Teacher B stated:

"... Overall, this Website helped me a lot in the process of teaching and learning, especially in addressing the problems of student learning. Each student has an individualized learning system for determining their success .. "

Mastering the physics abstract concept

Students can master the abstract concepts in physics after using the PtechLS module.

Teacher B explains:

"On the whole, ... the objectives have been achieved. In my opinion, it is accomplished and ... information or the results of the students' work, he did achieve its overall objectives. That is, students, everything student does ... 100% it follows our learning objectives. What we want, he (student) will try to find and send it to us .. "

IT Skills Enhancement

Analysis of interviews with both teachers of physics shows that PTechLS Physics Module can improve their IT Technology Skills.

One teacher explained:

'I love it. I really liked it because it gave me the opportunity, for example in terms of the use of IT, ok, the use of IT because if we use the regular education system, chalk-and-talk, so we have a slight advantage at the moment, right. So we apply it to what we have in terms of IT'

There are weaknesses noted by teachers in the assessment. Teachers indicated that PTechLS Physics Module is quite unsuitable for most materials and learning resources associated with this module because it is in English while teaching activities in the classroom is conducted using Malay Language. Teachers suggested that the module should be fully developed in the Malay language, including links to web resources. In addition, it should be supported by the resources of additional reading for the students.

IMPLICATIONS AND CONCLUSIONS

The PtechLS Physics module is effective as evidenced by the significant increase in student achievement after its implementation. However, it does not specify whether this increase is due to the module only, or whether other factors such as extra lessons in the classroom or extra classes contributed to the increase in test scores. Effectiveness of the module may indicate that the module is suitable for students who are active and reflective learners. Similar studies that have been conducted have also shown that the PTechLS Physics

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module effective to students' with active, reflective, visual and verbal learning style (Norlidah Alias, 2010; Norlidah Alias, Saedah Siraj, Dorothy Dewitt, Mohammad Attar and Abu Bakar Nordin, 2013). However, it is still uncertain if this module will prove to be effective for other learning styles than the one used in this study. Further research should be conducted to investigate this concern.

In addition, the effectiveness of the module was only measured by students' achievement. The assessment is similar to past studies conducted by Norlidah Alias (2010) and Sahasrabudhe and Patnaik (2014). Other additional factors such as motivation, critical thinking skills, and social interaction can be measured to determine the effectiveness of the module. Usability evaluation proves that the teachers, who were the implementers of the module, found that the module can be used for teaching according to students' learning styles, and can be used for students to master science concepts. In addition, students' interest can also be improved.

Teachers are important agents of change and their perceptions are important for the success of the module implementation. In this study, the teachers showed that they agreed with the usability of the modules and understand the benefits towards the students. However, they stated that the content was inappropriate because of language used (English) was quite challenging for students.

Overall, the findings this study showed that the matching of learning styles with activities, using appropriate technology benefited the students. The discussions were conducted among teachers on how to deal with different learning styles while conducting activities in the classroom. This awareness will assist teachers in designing the teaching activities; taking into consideration the students different individual learning styles. Therefore, the researchers suggest that further studies should be conducted to determine whether this PtechLS Physics Module is effective to different environments of learning, and whether it can be used by other rural secondary schools from other areas in Malaysia. In short, this project was able to identify relevant technologies for teaching to different learning styles so that students can master the science abstract concept. In future, it is hopes that teachers and students will be able to use ICT tools suitable for the learning according to the students learning style.

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The Learning Styles And Learning Emotions Of Adult Learner In E-Learning Environment

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Abstract
E-learning becomes ubiquitous with the availability and accessibility of the technology devices. Modern educational technology has changed the way people are acquiring skills and knowledge. Learning by using technology is different from learning in the classroom because performing learning using technology is much more flexible and personalized. In such case, how the learners usetechnology to learn and what they learn are still a concern and question to most educators, especially in this information-loaded era.
Every adult learner is different, thus, to find out the learning styles and learning experience from different learners while using technology is crucially important because the findings are able to help adult learners to increase their learning achievement and satisfaction. Moreover, many researchers have looked at the social emotions of adults, but little has been done to examine their learning emotions and how they affect their learning styles. In the preliminary study of this research, it has been found that learners'emotions and learning style are interrelated and they affect the daily learning activities. The positive learning emotion that respondents reported they felt from the study is excited, whereas the negative emotion that mostly observed is nervous.

INTRODUCTION

Technology is providing more impressive and effective learning experiences to the learner especially in the educational sector. Today, it can be observed that many students and working adults use e-learning platforms to earn their degrees, develop new skills and acquire new knowledge. Based on the Top 10 eLearning statistics for 2014 article and info-graphic, it is estimated that about 4.6 college students are taking at least one course online today. However, by 2019, roughly half of all college classes will be e-learning-based (Pappas, 2013).

This tremendous growth on the number of e-learners has drawn major concern from the educators, academicians and instructional designers in thinking of how to provide an effective learning platform to the learners online by integrating modern learning technology.

Based on the Internet World Statistics (2008), 20.1 million, or nearly 67 percent of Malaysia's population of 30 million is on the Internet. The number of Internet users among Malaysians grew 25.9 percent from 2008 to 2014. Internet use is expected to grow even more with the proliferation of mobile technologies coupled with the availability of increasingly

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affordable broadband Internet access (Abas, 2009). Consequently, these technologies shed light on the future potential of e-learning as a new learning method for everyone.

When the learning process takes place, learners'emotions and learning styles play important roles in the learning process. Emotions as an aspect of individual identity,are cited as one of the factors in the learner category,that play a role in self-directed learning (Rager, 2009). Furthermore, Zembylas (2008) notes that emotion is hardly absent from online learning contents. Online learning could probably produce a new way of learning, emotions and bring new learning experiences to adult learners. Thus, the purpose of the study is to find out how different types of learning styles and learning emotions can be incorporated into the various learning experiences of adult learners.

LITERATURE REVIEW

Education and Learning

The learning process is continual but not continuous. Learning happens all the time, while education occurs at a specific time. Thus, it can be affirmed that learning is a part of the education and the educational experience offered by the institution and forms part of the on-going change process for an individual. Qi et al. (2009)summarises the ICT adoption evolution in Higher Education Institution which reflects the development of information technologies.

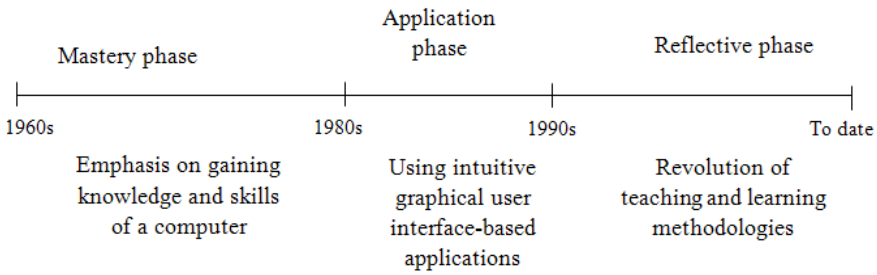


Figure 1: ICT adoption evolution in Higher Education Institution (adopted from Qi, Liu and Wang, 2009)

Adult learning

Andreasen, Buhl, Fadzil and Munira (2012) have done a survey on the perspectives of different countries (South Korea, Latvia, Thailand, Denmark, Slovakia and Malaysia) on the concept of learning. From the findings, it has been shown that these countries are shifting to a new learning paradigm in practice, where learner-centered methods, learner-automated and self-initiative learning environments are well promoted with the integration of the ubiquitous technologies. Additionally, Malaysia is adopting the blended-learning approach, where the activities of e-learning are positioned between desktop learning and mobile learning (Andreasen et al., 2012).

Every group of adult learners is different. Different adult learners have different demandsfrom learning. A concept of adult learning theory –Andragogy, was introduced by Malcolm Knowles in 1973. The following table compares the theory of Pedagogy and Andragogy.

Assumption	Pedagogy	Andragogy
Self-concept	Dependency	Increase self-direct
Experience	Of little worth	Learners have rich resources of learning
Readiness	Biological Development of social pressure	Increase with social roles
Time perspective	Postponed application	Immediacy of application
Orientation to learn	Subject centered	Problem centered
Design Elements		
Learning process	By teacher	Mutual planning and negotiation with teacher

Table1: A comparison of Pedagogy and Andragogy (Adapted from Malcolm Knowles, 1978, pp. 104)

However, whether new learning styles generate among adult learners, and how the technology brings influence to the emotions and experience for them is still left unanswered. Due to the existing gaps found in the previous research, this research has been conducted to answer those questions.

Learning style

According to Kenner &Weinerman (2011), adult learners have their self-directed learning style and they have developed their own strategies and patterns of learning. These patterns of learning could help the adult learner to learn easily, quickly and effectively. Williams and Etherington (2013) found out from their study that learning styles are fluid and flexible from different learners. Hence the "one size fits all"teaching approach is unlikely to be effective for the learners. Knapp (2003) proposes that learners are more likely to learn if the learning styles match with the learning environment. In his study applying the Kolb's learning style, convergers and assimilators is the most common group of learners among the business major's undergraduates. Also, these two groups of learners scored higher GPA's compared with the diverger and accommodator groups. In other words, learners have been found to use abstract conceptualization in their studies. Rakap (2010) found that learning styles or learning

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preference has significant impact on adult learners'knowledge acquisition. Learners with a read/write preference have higher performance levels in quizzes when compared with learners with a kinesthetic preference.

Learning emotion

Emotions are significant in the real world, but how about in the virtual learning environment? Are they still 'real'? The learners express themselves differently in the real and virtual environment. The role of emotions in the virtual learning environmentcannot be neglected. O'Regan (2003) claims that life in the face-to-face world is different from life online and describes the life on the internet asa"mask"of all sorts. Emotion exists in the e-learning environment (Tian et al., 2014), where good feelings engage learning (Jeagadheesa et al., 2014). Wang and Chen (2012) figured out that self, task, performance, context, social and technical problems are main sources that cause emotion in the learner during their learning process.

Emotions cannot be absent from the online learning context (Zembylas, 2008; Sandanayake, Madurapperuma& Dias, 2011; Cleveland-Innes &Campbell, 2012). Recent studies show that online learners experienced positive and negative emotions (Zembylas, 2008; MatuliauskaitėŽemeckytė, 2011; Cleveland-Innes & Campbell, 2012; Glancy and Isenberg, 2013) such as excited, enthusiastic, confident, frustrated, enjoyment, hope, anger, anxiety, fear, sadness, surprise, and alienation. Positive emotions served as a motivator for learning; while negative emotions impeded learning (Rager, 2009; Hascher, 2010; Wang & Chen, 2012; Shuck et al., 2013). Sorić, Penezić&Burić, 2013; Kim, Park &Cozart, 2014) found that male and older learners demonstrated higher levels of negative emotions such as unhappiness, anger and humiliation.

Drawing on the aforementioned literature, this study proposes as follows.

i. To identify the types of learning styles and learning emotions of the adult learner and the way they affect adult's learning experience in the e-learning environment.

ii. To explore the relationship of learning style, learning emotions, learning patterns and learning experience of the adult learner in the e-learning environment.

METHODOLOGY

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In order to get an in-depth understating of how the adult learns in an e-learning environment, a qualitative approach is used in this study. In the first stage, a questionnaire survey will be given to the participants and the scope of demographics, learning experience and learning emotions will be identified. In the second stage, participants will record their emotions using the weekly emotion journal. The journal will be collected at the end of the month. After that, interviews will be carried out during the semester. A total of two semi-structured interviews will be conducted. The purpose of using the semi-structured interviews is to discover what the learners'learning experiences are in using the technological tools in their learning. Besides that, this study will also help to explore what the learner feels with regard to the use of technologies in their study. The data collected will be analyzed individually and presented in a profile. From the profile, the patterns of learning, and changes of emotions throughout the semester will be observed. Other than that, the learning styles and learning emotions across different learners will be compared and contrasted.

DISCUSSION

In the preliminary research, the participants were happy and felt proud upon the completion of the learning tasks. The successfulness improved their level of confidence and excitement. They served as the source of motivation for the adult to move forward and deal with bigger challenges in their life. Moreover, adult learners feel confident in using technology to perform learning; however, the older ones expressed more insecurity brought on by the technology, especially the technical part of the technology.

From the findings of the preliminary study, it has been found that the greatest fear is from the examination the participants sit for at the end of the semester. It has been observed that their negative emotions are greater than their positive emotions during that period of time. One of the participants felt stress and dealt with insomnia. However, the participant tried keeping optimistic and believed that the challenges could be overcome. A source of nervousness is the time constraint and they were afraid that they could not complete their assignment on time. In addition, learners claimed that they show different types of traits in the real and virtual environment. Learners feel comfortable in the face to face interaction with peers, but they claimed that they are lacking in confidence to speak their opinion in front of the class. They are more likely to express doubts in the online platform.

CONCLUSION

Adult learners need to get rid of all kinds of psychological obstacles in order to successfully complete their learning. Distance learning means different things for different individuals using various media to obtain the knowledge of information. Thus, there are some

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new psychological factors to be discovered from this group of adult learners. In addition, not all learning using the technology will lead to a positive learning experience. Hence, what are the positive and negative learning experiences that the adult learners had? An in-depth understanding of what types of emotions and learning styles exist in the e-learning environment would greatly aid the instructional designers in formulating a learner-oriented learning strategy as well as in allocating the learning resources more effectively. The study needs to develop a detailed evidence base of how adult learners integrate the use of ICT in their learning process.

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The Mourning Of The Deliberate Strategy For The Arising Of The Emergent Strategy

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Abstract
This document aims to propose a theoretical relation between the psychological mourning and the process stages described by Elisabeth Kübler-Ross for dying patients with the process of strategy formation. According to Henry Mintzberg, the process of strategy formation is composed initially of two types of strategies: intended strategies and realized strategy, and when a strategy is intended and realized, is matched a deliberate strategy; equally there are strategies that were not intended but were realized, these are emergent strategies. According to Montoya there is a cycle between emergent and deliberate strategies. When the deliberate strategy is applied, it may be affected by a limiting element that deconstructs the development of the strategy; in this situation it is proposed the agent enters in a psychological process of mourning over the loss of its plan, due to breaking the link between the agent and the deliberate strategy. This article contributes to understand how the agent passes through the stages of mourning (denial, anger, bargain, depression and acceptance) and how after it realization, the agent ignores the deliberate strategy and enables the arising of the emergent ones to continue viable in the system. For these stages take place will design a pilot test performed with a workshop in the classroom with students of Universidad Nacional de Colombia, Medellin, with an age range between 17 and 23 years old. This exploration concludes mainly that the agent has a link with the deliberate strategy and when a deconstruction happens, the agent enters in the mourning process as a natural response to this rupture between the agent and the deliberate strategy, and it has to go through all the stages of the mourning process up to the acceptance of failure for deliberate strategy. Finally, this acceptance will let the arising of the emergent strategy that allows continue being viable in the system for decision making.

Keywords: Deliberate strategy, emergent strategy, mourning, process of mourning

INTRODUCTION

For several years, the concept of strategy has been discussed and one of the most important inputs has been explained by Henry Mintzberg (1987) regarding the process of strategy formation, where he explains the concept initially from the existence of two types of strategies: the pretended and the realized ones. When a pretended strategy gets to be a realized one, it becomes a deliberated strategy and if the strategy is realized but not pretended, it is called an emergent strategy. Additionally, he defines the strategy as a pattern in a stream of decisions and argues that decisions are a commitment to action. Montoya (2010) takes up the idea outlined by Mintzberg, related to the cycle that may occur between the deliberated and the emergent strategies, allowing an initial answer to the process of strategy formation, where

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there is an intertemporal connection between the pretended and the realized strategies. Through the cycle between the deliberated and the emergent strategies, the agent learns, because it is subjected to learning-recycling processes, combined with the development of possibilities. This is evident, when a comparison is carried out, between the behaviors of the agent before the beginning of the cycle and after it is finished for decision making; this leads the agent to maintain a condition that allows it to remain viable inside a system (Montoya & Montoya, 2013).

When the agent is passing through the planning process of the deliberated strategy, it generates a link with it, which might be broken when the agent begins the execution process and a deconstructive situation appears; that is an event that stops the execution of the plan, which pretends to take the agent to the accomplishment of the goal; this leads to the meditation of the beginning of a psychological mourning process. The mourning explains the behavior of the agent in front of the failure of the deliberated strategy, given that from the definition of Freud (1917), cited by Zaragoza (2007), it is determined that mourning is the answer to the loss of a loving one or some similar representation, such as the homeland, ideals, among others. Kübler-Ross (1993) sets the mourning process and divides it in five stages that, in order, are determined by a sense of denial, then anger, followed by bargain and at the same time, the agent enters in a depression to finally go through the acceptance of the loss. It is important to point out the fact that the studies developed by the author are related to death and dying persons.

Taking into account the effect that the deconstruction of the deliberated strategy causes to the agent, it may be considered that the agent carries a psychological mourning process to the deliberated strategy, which will permit the beginning of the search of an emergent strategy that maintains the cycle and the viability of the agent in the system. For that reason, this article helps to understand how the agent passes through this process and its different stages.

The first part of this article will describe the process of strategy formation, the concepts of deliberated and emergent strategies and the cycle between them. The second part will show some definitions of mourning and the stages of the process, said by Elisabeth Kübler-Ross for dying patients. The third part will contribute to understanding how the agent faces its rupture of the link with the deliberated strategy, from the stages of the psychological mourning process. Finally, the fourth part will perform a “Beer Game” as a pilot test to validate the

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stages of the mourning process at the moment of the rupture of a link between the agent and the deliberated strategy.

1. STRATEGY FORMATION

The strategy arises formally in the '50s, at the Business school in Harvard, with the Business Policy course, where the question "why are some organizations more successful than others, despite the fact that they share the same context?" was debated. To answer it, relevant aspects on how companies such as General Motors, Estandar Oil, Duppont and Sears, Honda and Toyota are directed, were studied (Rivera & Malaver, 2011). From the military perspective, the strategy was already seen as an important position, compared to its adversaries, in fact, the most accepted stream about strategy, holds that its meaning lays on having a group of activities, related, but hardly imitated, so that it leads to a valuable, unique position, in comparison to the opponents (Porter, 2011). This perspective of the strategy formation is part of a positioning approach, framed with planning and design approaches, in a rational conception of the process of strategy formation. Talking about the positioning approach, the most relevant author cited by Porter, focuses on the search of the reason why some organizations are successful and some others are not, concluding that the difference that guarantees success is a competitive position that, as consequence, has a financial and sustainable development through time, in a global environment (Montoya, 2010).

Porter (1991) holds that the reason why there is a privileged position to generate a positively different financial performance, is in one of the following possibilities: first of all, through understanding the strategy from its integrative function of the activities of the organization. Secondly, through seeing the strategy as the search of correspondence between the opportunities and the politics defined on the market, with the organization's internal goals and rules well established, to direction, on the same way, the organization with the environment. Or thirdly, to understand the strategy as the generation of distinctive competencies, that leads to a competitive position of the organization, from the strengthening techniques, processes and distinctive products (Porter, 1991).

Regarding the approach of Porter, there are some important criticisms about his conception of a firm, as a set of discrete activities and the operational view of the value chain, seen on the activities, ignoring a full conception of the organization as a whole. Another criticism is focused on the consideration of some central assumptions of the five forces model. According to Montoya (2010), these were questioned by the demonstrations made by Coyne &

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Subramanian (1996), were they assure that there are some alliances between the agents of an industry, which has a certain degree of mutual dependency.

The strategy formation approach, as an adaptive process, unlike the rational one, highlights the activities that the agent or the organization does to get an adaptive harmony with the environment and with themselves; which suggests a long term evaluation and focuses on reaching some economic efficiency goal and adaptive problem-situations solutions, through the domination of the "production network". This last one is considered the social structure of the organization, which are: institutions, combinations and routines, and political coalitions between interest groups (Montoya, 2010). The adaptive approach understands that the agents are known for their bounded rationality (restrictions to get full information, costs and time invested on the exploration of the solution, constant changes of the environment and psychological limitations) at the moment of decisions making they are submerged in the reaching of an satisfactory solution to the problem, but more than optimal, where the model is closer to reality, in comparison to a decisions making model, where the agent has full rationality and the organization is a closed system, known by its rational approach (Montoya, 2010). In fact, the adaptive approach, with the resources and capacities school (RBV) and the rational approach with the positioning school, has created the opposite limits of the formation and strategy theories and has separated the investigators from the conception of a strategy as a stream pattern of decisions, which is Mintzberg's input, that contributes to the understanding of the strategy concept and turns him in one the most cited authors (Montoya, 2010).

Mintzberg explored the strategy concept from several allusions, the first one comes from the concept of plan, highlighting as the plan's characteristics, the fact that they are consciously generated and with a determined purpose. That way, he explains the plan as a set of action courses consciously pre-established as a guide, which interacts or intervenes over certain situation that lays on the base of a defined purpose (Mintzberg, 1987). The second allusion is the concept of strategy as a position, where the organization avoids the competitors on a "product-market" structure and reaches a "niche" that generates a remarkable economic rent in comparison to the competitors; at this point, the organization stays away from the competition. The third allusion of the strategy concept is like a pattern, that contains a persistent behavior and that determination comes from a conception of the organization in the environment (Mintzberg, 1987).

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Mintzberg criticizes the conception of the strategy just from its explicit part, in terms of Montoya (2010), "it is not enough for the organization and it is not operational for the investigator […] the investigator is forced to study the conformation of the strategy as a perceptual phenomenon, which leads to abstract normative generalizations" (Montoya, 2010). The relation directed by the strategy, between the organization and the environment cannot be developed in a passive way, before the opportunities and threats offered by it, but there must be an active and continuous attitude that allows it to be adapted in a changing environment (Hax & Majluf, 1988).

On the approach introduced by Mintzberg, it is suggested that a big part of the work done on the strategy direction is the approach of the consequences of the strategy, without consensus of the authors about the relation with the concept of strategy. Montoya (2010) also stands out, from Tsoukas (1994) work, that it is considered that after the inputs made by Mintzberg, there is an evidence of the conformation of the strategy concept, from the reconstruction of facts after the application, or as something beyond plans over a claim base. Finally, the intention of Mintzberg is to promote the studying of the strategy problem from an evolutional strategy perspective that uses the feedback as a learning mechanism in the method of trial and error and additionally the use of future conceptions, to be anticipated. (Montoya, 2010).

Summing up, for Mintzberg, the strategy must be seen as a stream pattern of decisions, pointing out that a decision is defined as a commitment to the action. Additionally, it contributes to clear up the concept of strategy through the inputs made by the definition of the deliberated and emergent strategies. On the following section both strategy concepts are going to be widened.

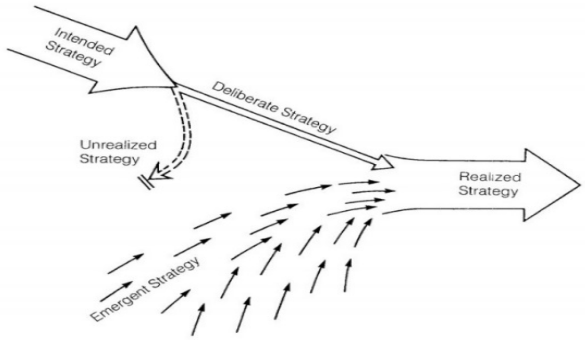
1.1.1. DELIBERATE AND EMERGENT STRATEGIES

On the search of understanding the concept of strategy, Mintzberg identifies that some plans may be intentional or intended and could be made or not. From there arises the concept of pretended strategies, that also arises from an anticipated conception of the situation for the consecution of a target and the strategies that are just realized ones. From the realized strategies, Mintzberg (1987) identifies that some strategies were realized and pretended, which concludes in a deliberated effort from the agent and leads to the consecution of a deliberated strategy. Also, there are unrealized strategies that are basically the strategies that were pretended but were never executed. Finally, there are strategies that were realized ones,

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but the agent never had the intention of making that happen, which indicates that it is an emergent strategy, as the result of the consecution of patterns and a clear absence of claim (See Figure 1). The pretended strategies that were not realized, for some internal or external reason to the organization, might pass through classification processes, where it is evaluated the relevance and effectiveness in the future, to be stored and modified, if necessary, to execute just in emergency situations and to turn it into a tool for the strategist or to be disposed because of its obsolescence (Montoya & Montoya, 2005).

Figure 1: Deliberate and emergent strategies.



Source: Taken from Mintzberg, 1987, p. 14.

For the strategies to be strictly defined as deliberated ones, they must have an exact formation of the realized strategy, from the pretended strategy and accomplish successfully three conditions (Mintzberg & Waters, 1985 cited by Montoya, 2010):

A. There must be an intention, which does not allow any ambiguities from the organization, with an established level of detail that does not show any doubt before the action is generated.

B. The intentions must be common for every member of the organization, because it is conceived as a collective action.

C. The collective actions must not be affected by any external force and, as consequence, the pretended strategy got to be a realized one, executing itself as it was supposed to. This leads to a completely predictable, benign and malleable atmosphere.

Montoya (2010) shows that Mintzberg highlights about the emergent strategies, the feature of arising from the learning and from the maneuvering processes, based on Quinn's (1980) work of "logical incrementalism" and on the other hand, the feature of feedback between the agents that generates a collaborative adjust seen on Lindblom (1959) and Braybrooke and Lindblom (1963). The deliberated strategies are necessary for the organization, because they generate a sense of right direction and at the same time, emergent strategies are not a

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synonym of absence of administration, on the contrary, they implicate learning from what is functional; they look for a pattern consistently viable (Mintzberg & Waters, 1985 cited by Hax & Majluf, 1988).

According to Montoya (2010), Mintzberg makes an outstanding proposal related to the investigation of the shaping process of the deliberated and emergent strategies and the interaction of the realized strategies with elements from the organization such as structure and context. He emphasizes the strategy formation studied as continuous or perhaps as the formation of a cycle between deliberated and emergent strategies (Montoya, 2010).

1.1.2. CYCLE BETWEEN DELIBERATE AND EMERGENT STRATEGIES

Mintzberg proposes a idea of a cycle between the strategies from his definition of pretended and realized strategies; the realized strategies nowadays have an intertemporal relation with the pretended strategies in a later period (Montoya, 2010). The notion of the conception of strategy as a cycle facilitates the combination of experiences, seen as the use of learning, with the expectations, seen as the collaboration of possibilities. This notion allows to get initial responses to the problem of conformation of the strategy (Montoya & Montoya, 2009). To Montoya (2010), the cycle is "a matter of repeated events and it is different from the feedbacks, because it links aspects of different natures between them".

Additionally completes the characteristics of the cycle with the time factor related to its periodic behavior, which allows the generation of a contrast and the conformation of a whole which is coherent and related to evolution. Montoya (2010) makes the following statements related to the cycle (See Table 1):

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Table 1: The relation between an entity to another and the adaptations in their evolutionary process allude to various levels

(I) An agent seeks for its variability and while it possesses internal models, it exhibits intentionality; (II) The agents carry their own evolution and selection conditions, through the constant modifications of their environment, according to their intentionality; (III) The agents are also other's agents (environments); (IV) For that reason, agents constantly generate decisions and actions. The actions end up in challenges that must be faced by other agents, which translated order in disorder trends; (V) The action of a higher agent, that acts as the environment, induces modifications, which can lead several variations; (VI) The operation of the agent that acts as environment for other agents, on the population level, creates pressure of selection imposed by external conditions; (VII) When there are mismatches while there are selection pressures and dynamics on the accommodation of niches, for the competition of local resources, the agent that operates as the environment, which is fulfilled with big generative potential and facilitates several streams of energy and materials, makes possible processes of self-organization and cycles of thermodynamic works that affect the production of agents inside its border. It is all about the appearance of the order, from chaos; (VIII) The elaboration of internal models is affected and the internal models compete and cooperate because of the appearance of new elements in the environment. This influence originates a new representation of reality; (IX) The cycle is closed when a reorientation of the intentionality appears.

Source: Compiled from Montoya (2010).

Montoya & Montoya (2013) assure that the entities (seen as agents, organizations or the environment) that belong to a group of cycles obtain resources and energy, which can be used later. The author outlines a comparison to that, which was said by Holland (2004) about the natural selection that must be seen as a cyclic recycling, where the evolution increases compared to the diversity. Also the autors assure that the same cycle applies a "self-organizational" process, which leads to the accumulation of loops in the gap between deliberated and emergent strategies, which allows the entities to move forward novelties in which there is not previous configuration. From the cycle, it could also be measured the levels of understanding of the situation from the entity (agent or organization); which can be evaluated before the beginning of a new cycle and after it is finished: to make a comparison of the perception of the situations at the two moments, where it is evident the potential cognitive enrichment from the agent, through its own experience (Montoya & Montoya, 2013).

Summing up, the cycle between deliberated and emergent strategies allows the evolution of the agent through the learning recycling process, this combined with the elaboration of possibilities. The progress shows up when comparing the performance before beginning the cycle and after it is finished. This evolution allows the agent to stay viable inside the niche in which it is, or at least have the possibility of staying in another niche that permits it to remain viable.

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2. MOURNING

Citing the Real Academia Española dictionary, which is available online, the word "mourning" comes from the Latin dŏlus which means pain, pity, affliction or feeling. It is also related to an expression before the death of a loving one and associates it with the act of waiting up a dead (Real Academia Española, 2014). On the other hand, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) - 5 written by the American Psychiatric Association, the mourning is the natural consequence of the loss of something meaningful, that is usually linked to the death of someone close, economic ruin, medical condition or complex disability, where some sadness, loss of appetite and sleeplessness conditions may appear, but it is perfectly normal in a depressive episode. (Americam Psychiatric Association, 2014).

John Bowbly, one of the most outstanding authors and pioneer of the Affective Theory (Fonseca, 2010), analogically defines "mourning" using the term "inflammation" in the physiology and pathology, to connote the consequence of certain physical processes inside the human body, which also happens with the mourning, because it is the response to the loss, linked with processes and states that are interrelated (Bolwby, 1993). Then Bowlby (1993) defines the mourning as "a wide set of psychological processes that start working as soon as the loss of a loving one happens, no matter the result". Additionally, the author shows an annexed use for the term mourning, which is traditionally from the Anthropology, where the concept falls to the demonstration of physical pain, shame or sadness in a public way; this to compare with the term of affliction, although the author defends the use of the term mourning in cases where a psychological process is activated consciously or not, from a loss. Another relevant concept mentioned by Bowlby (1993) cited by Freud (1960) is about the "Mourning Work", which is textually "the effort that makes the individual to accept an occurred fact in the external world (the loss of a cathected object) and to carry out the corresponding changes in the inter world (withdrawal of the libido from the lost object, identification with the lost object)".

Meanwhile, Zaragoza (2007) compiles the most outstanding definitions around the concept of mourning; citing Freud (1917) who textually defines mourning as "the reaction before the loss of a loving one or of an abstraction that plays the same role, such as the homeland, the freedom, an ideal, etc". Additionally cites Steen (1988), who assures that the mourning, can make a person grow and lead to maladaptive behavior by the mourner (Zaragoza, 2007). On

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the same way, the author holds that the mourning may be considered as the lack of capacity from the individual, to face particular situations because of a temporal personality chaos, linked to a crisis or disorder associated to the loss (Zaragoza, 2007).

2.1. PROCESS OF MOURNING

Elisabeth Kübler-Ross, in her studies about death and dying persons, determined five stages that an individual who is close to death or suffers a palliative process, experiments. These stages are also identified as a mourning process:

Denial stage: It is very common on patients who have been informed that they suffer a medical condition that is going to lead to death on a short period of time, to have an initial reaction of denial, arguing that it is not possible to be affected by such pathology. This denial is followed by the desire of consulting different medical opinions, looking for a new diagnosis, a more positive one, completely opposite from the original one (Kübler-Ross, 1993).

Kübler-Ross (1993) assures that denial is generally a provisional defense mechanism before the actual situation, which, in a short period of time, will be replaced by the partial acceptance. She expresses that in some rare cases, patients maintain the feeling of denial until the end, to cover up the real situation and contextualizes it with the case of a patient who suffered from breast cancer, who presented a persistent denial of her medical condition and kept it that way until moments before passing away; the patient wore make up every time brighter and more colorful dresses; besides, she referred to her condition as a simple wound.

Anger stage: After the stage where the patient faces the denial to the actual situation and begins to question reality, then passes to understand it and accept it on a partial way, admitting that is suffering from a disease that is going to take the life away. This sense of acceptance translates the patient to recognize how sick and near death it actually is, which makes it look for the answer to "why is it the person chosen to suffer from such horrible medical condition and not someone else? The person questions its productivity before the world and everyone else; this stage is harder for the patient's close ones, because the dying expresses its anger through every near element. In addition, glimpses of pain, tears, guilt and shame show up, by avoiding contact with the nearest ones. The anger comes from the sudden rupture of everyday activities developed by the patient and, at the same time, seeing future projects interrupted (Kübler-Ross, 1993).

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Bargain stage: Kübler-Ross (1993) mentions that this stage is neither so common nor identifiable during the process, but it emerges as a similar behavior to kids when they order something and then ask it in a docile way; generally they can make a tantrum search to what they want, but when they realize they are not going to get it that way, then they look for a bargain space, where, for instance, they offer a domestic service in exchange for their demands. Same thing happens with a patient who is in a palliative situation. It knows, because of past experiences, that from a good behavior, it can achieve the desired benefits (Kübler-Ross, 1993). This occurs in every environment situations, such as the relation with a superior being, in which it enters in a bargain of the acceptance of the disease in exchange of it to be easier to carry it until the end.

Depression stage: On this stage enter those patients who have been undergoing several surgical procedures that affected their look, as well as those who lose a lot of weight because of strict diets; then they cannot keep a positive attitude before death. This stage is based on a sense of loss, same feeling that, for instance, a woman gets when one of her breasts or perhaps her uterus is removed, and she feels that she is not a woman anymore (Kübler-Ross, 1993). There are two types of depression: reactive and preparatory depression, where the first one is the answer from the patient to all the consequences of a degenerative medical condition, such as medical procedures to which it is subjected and the effects over the physical appearance. On the other hand, the second type of depression is related to economically facing the disease that usually has high costs and leads to the loss of the patient's goods, leaving them without a job and unable to make their dreams come true, which consequently leaves to the end, death (Kübler-Ross, 1993).

Acceptance stage: After passing through the previous stages, the patient leaves behind many of the feelings that it was carrying; it stops feeling angry with those who do not suffer from its disease and are not aware of how close their end is, and they stop feeling depressed about their situation. This stage must not be conceived as a happy stage, because it is a feelings-free stage, in fact, the professional help from psychologists must be directed mostly to the patient's relatives and friends. Patients remain on a face of forgetting the external world and do not want to be disturbed with news from it; they accomplish a peace, acceptance and tranquility state, in which the only hope is to expect the inevitable (Kübler-Ross, 1993).

On this stage the patient realizes that death in inevitable and that it may occur at any moment, although some patients fight against their disease until the very end and keep the

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hope of overcoming it, this type of patients do not get to the stage of acceptance. These stages described during the mourning process by Kübler-Ross (1993), have been validated and reinforced by several authors. Sánchez & Martínez (2014) made a recollection of authors that, for link ruptures, were there is a more emotional than physical breakdown, they validate each one of the mourning stages described by the theory of Elisabeth Kübler-Ross (Sánchez & Martínez, 2014). (See Table 2).

The following section of this article will combine the mourning stage explained by Kübler-Ross (1993) and the concept of conformation of strategy, to explain the behavior of the agent, while facing the failure of a deliberated strategy.

Table 2: Authors who support the stages of mourining proposed by Kübler – Ross

Mourning stage	Authors that propose stage
Denial	Kubler-Ross (1969), Suiza (1974, en Zaragoza Toscano, 2007), Horowitz (1976), Clark (1984), Staudacher (1991), Robinson (1996), Cabo de Villa (2007).
Hostile reactions (Anger)	Kubler-Ross (1969), Caruso (1989), Horowitz (1976), Backer, Hannon, y Russell (1982), D'Angelico, (1990), Staudacher (1991), Robinson (1996), Cabo de Villa (2007).
Bargain	Kubler-Ross (1969), Bowlby (1980), Backer, Hannon y Russell (1982), Suiza (1974, en Zaragoza Toscano, 2007) Clark (1984), D'Angelico (1990), Staudacher (1991), Robinson (1996), Roccatagliata (2000) y Cabodevilla (2007)
Hopelessness (Depression)	Lindemann (1944), Kubler-Ross (1969), Davidson (1979), Backer et al. (1982), D'Angelico (1990), Staudacher (1991), Worden (2004) y Robinson (1996).
Acceptance	Kubler-Ross (1969), Caruso (1989), Prigerson et al. (1980), Backer et al. (1982), Clark (1984), D'Angelico (1990) y Staudacher (1991).

Source: Compiled with information from Sanchez and Martinez (2014).

4. THE MOURNING OF DELIBERATE STRATEGY FOR THE RISE OF EMERGENET STRATEGY

Bowlby (1993) holds the discussion about the terminology used with the word "mourning", where he highlights that some critics have attacked him for the excessive use of the term, assuring textually that "the mourning accomplishes a very precise psychic task: its function is to separate the dead from the memories and hopes from the remaining ones" using the term "mourning" as something restrictive, that only applies on the consecution of the result. The author points out that the restrictive use of the term is contrary to the investigative thought and from the typecasting of the world vision, it does not contribute to the evolution of the definition. It is referenced the discussion presented by Bowlby (1993), to use the term mourning to name the process that the agent passes through when the deliberated strategy is deconstructed. The explanation of this process will be based on the stages exposed previously, developed by Kübler-Ross and her whole theory about the process of mourning that a dying patient passes through, closer to death.

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When an agent generates a deliberated strategy to accomplish a goal, it passes through the respective planning process and determines all the stages of a plan to reach that goal; calculating costs related to the execution and determining what the financial sources are, to turn the pretend strategy in a realized one, creating a link between the agent and the deliberated strategy. But for some reason related to the environment, or some consideration skipped by the agent during the process of planning for the execution of the deliberated strategy, there is a possibility that it might be affected and becomes useless to reach the realized strategy. The rupture of the link between the agent and the deliberated strategy and the deconstruction of the link with the whole process of planning and dedication in the pretention of its faithful execution, generates on the agent a process of mourning described by the psychological mourning stages. The agent will feel a sense of loss, where the deliberated strategy will be unfocused on the reality and is not going to be applicable. The rupture of the link and the sense of loss, activates the process of mourning, because on its definition, the mourning is a normal response to the loss (Bowlby, 1993).

According to Kübler-Ross (1993), the first stage of the mourning is the denial one. At the moment of the appearance of an obstacle that indicates that the deliberated strategy is not going to be applied, the agent is going to face the stage of denial, in which it initially questions whether the deliberated strategy truncator element exists or not, then ignores it and looks for the way to move on with the plan; the agent, just like the dying patients, will use bargain as a defense method to the real world, reaching the continuance of its pretentions. Additionally, the agent on the denial stage stands out its deliberated strategy perfection and the impossibility of its failure, because it highlights its skills as a planner and how strict were all the phases, to achieve the realized strategy. On the same way, it will look for different concepts from the impeding object, all of its time and space features and how it, directly or indirectly, affects the deliberated plan.

After passing through denial, where the agent does not consider the failure of its plan, the next stage is the anger, where the agent begins to recognize that its plan is failing and tries to look for the impeding element of its deliberated strategy and discharges the anger and the frustration feelings, coming from the loss of the plan. This first two stages of the mourning of the deliberated strategy are exacerbated by the fear that the agent might feel for the turbulence of the future, because it does not know for sure what is going to happen after the rise of the impeding element, that highly disturbs the temporality and the harmony of the activities placed on the plan, to extent that it may become obsolete and leads to a total drop of the

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deliberated strategy. At that point, the agent would be completely exposed to the environment, without any strategy with which it could face it and reach for the goal. This would lead it to begin the next stage, the bargain one, where the agent will look for the meditation of the situation of its plan and somehow save it, even though some changes must be made. On this stage, the agent questions itself and its environment, in relation of what does it do from the present obstacle on its plan. Equally, it will realize that its deliberated strategy has failed and will start to consider new alternatives to save the situation; just like with dying patients, the agent will look for alternative past experiences that work to accomplish the goal or that at least help carrying with the situation.

The next stage is depression, in which the agent feels sad about its imminent loss and begins the recognition of its plan's failure before the consecution of the goal, that might be bordered by a reactive depression and the preparatory depression might be related with the placement of the resources, so that the agent remains viable before the goal. Last stage is the acceptance, where the agent definitely accepts that its deliberated strategy did not work and that it is not viable that it becomes a realized strategy. On this stage, the agent leaves the feelings it has for its plan behind and the effort dedicated for its development. Similarly, the agent has to pass through the rest of the stages to get to accept the death of its deliberated strategy (See Table 3).

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Table 3: Stages of mourming deliberate strategy

Stage	Characteristics
Negation	- The agent defends itself from the reality. - Emphasizes its skills as planner. - Questions the impossibility of failure of its plan.
Anger	- Partial acceptance of a truncator element affecting its deliberate strategy. - Anger comes from the breakdown of the plan. - Releases its anger against its surroundings.
Bargain	- Preliminary alternatives questioning to continue with the plan. - Makes considerations regarding the continuity of its plan. - Consults on past experiences to find a solution.
Depression	- The agent feels sadness for the loss of its plan. - Stops having a positive attitude to the plan.
Acceptance	- Puts aside fellings. - Definitely accepts the deconstruction of the deliberate strategy. - It´s necessary to go through the other stages to reach to accept the link breakdown between the deliberate strategy and the agent.

Source: Authors.

Possibly if an agent does not pass through the mourning process for its deliberated strategy, perhaps for pride or fear, the consecution of the goal will completely fail. It may happen that the entity passes through some of the stages, but do not achieve the acceptance. The agent might stay on the denial stage and preserve its deliberated strategy, insisting that its plan is perfect and applicable, turning it in unviable. Similarly on the anger stage, if the agent stays there, reproaching the environment and itself for the failure of the plan, it is not going to be able to accomplish the goal. Also if it gets to an awareness state that allows it to understand that it is failing, but do not pact an agreement with the bargain process between the plan and the environment. At the same time, it may happen that the agent blocks itself because it remained fussing about the failure of the plan. If the agent does not get to the acceptance of the failure of the plan, it will not be able to open the door of the arising of a new emergent strategy that allows it to remain viable in the system.

5. A BEER GAME APPLICATION

Previously, it was developed a theorist relation between the mourning process and process formation of the strategy, where it was shown how the agent passes through the mourning stages at the moment of suffering a rupture of the link with the deliberated strategies and how it is presumed that when the agent overcomes the mourning process, a new emergent strategy would be born. This part of the document will describe the use of the "Beer Game" as a pilot test that proves the existence of the mourning process when a deliberated strategy deconstruction occurs and afterwards, the rupture of the relation between the agent and the plan.

The "Beer Game" is a didactic activity, developed by the Sloan School of Management of the Massachusetts Institute of Technology – MIT in the early '60s, where the reality is abstracted in a lab game, in which it is possible to visualize the dynamic of a production and distribution system of an organization that produces beer; each one of the players is free to make decisions towards maximizing its earnings in its spot on the distribution chain (Senge, 1995). Just like Senge (1995) describes it, the game counts with the following roles from the distribution chain: the first one is the retailer, the second one is the wholesaler and the third one is the producer. Each one of these roles makes purchase operations of the following role. During the process, the retailer orders something from the wholesaler, the wholesaler orders something from the factory and the factory programs its production, according to the demand from the wholesaler. On each one of this process's stages, there is a deadline of four weeks (Senge, 1995).

The demand at first, maintains a constant behavior during each one of the stages of the process, but from the release of a musical video that involves the main product of this distribution chain, "the in love people beer", the sales increase; which leads that from the retailer, there is a bigger amount of product required. Just as out of the blue as the demand increased, it was stabilized and, again, the amount of the required product changed in each one of the stages. It is important to stand out that there is an opportunity cost associated with the costumers that were not served satisfactorily and there is an inventory cost when it exceeds the capacity of the warehouse

According to Senge (1995), the general result of the game is that each one of the contestants ends up with high inventories, which is related to a behavior pattern that surpasses

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the individual and, as the author suggests, it is inherent to the game and the way its structure was conceived. An explanation to this situation is associated with the result of the decisions that people make inside a system, regardless whether they think differently or not; the individuals are influenced by the behavior of the system. Each one of the players is forming a strategy from the stream of decisions's pattern, that it is generating with each one of the orders, which is happening on a planned way and turns that strategy in a deliberated one, a pretended one, looking for a realized strategy.

Towards giving the desired effect of deconstruction to the strategy that was planned, it is proposed a sudden close up to the game, which, as consequence, will allow the evaluation of the feeling the agent gets at the moment of the rupture of the link with the deliberated strategy (See Table 4). To test that sense, a poll was designed, to try to identify the impact that the rupture of a plan has and to establish the emotions of the agent within the process. Also, the contestants are questioned about the link sensation that they may have with the plan, if the deconstruction of the deliberated strategy worries them, how much do the feelings from the mourning process participate by the time the game is suddenly finished and if they consider that getting rid of the deliberated strategy earlier, facilitates the arising of an emergent strategy (See Appendix A).

Table 4: Survey variables.

Research Objective	Variable	Description
Identify the impact of the breakdown of a plan and establish the emotions felt by the agent in this process	Link	Identify the perception that those involved in the beer game in relation to the link they have when developing a plan.
	Deconstructor element	Identify the perception of the agent in relation to the sudden ending of beer game as deconstructive element of the plan.
	Stages of the mourning process	Identify the assessment that gives the agent to the stages of mourning (denial, anger, bargain, depression and acceptance) at the moment of deconstruction of deliberate strategy.

Source: Authors.

6. CONCLUSIONS

During the strategy formation process, if the deliberated strategy is truncated by a deconstructive element, the agent initiates a psychological mourning process, which is the natural response to the rupture of a link between the agent and its plan and will lead it to face the rest of the stages of the mourning process.

The agent must pass through all the stages of the mourning process of the deliberated strategy, to consider the arising of an emergent strategy and if the agent do not get to the final

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stage of the process (acceptance), it will not be able to admit the failure of the deliberated strategy.

Possibly the agent would not pass through the mourning process of the deliberated strategy for two reasons: the first one, the pride, which leads it to think that its plan is perfect and that the time and resources invested on the plan cannot be disposed so easily, even though it is evident that the plan is not viable. The second one is fear; through recognizing that its plan is failing, the agent would not quit its deliberated strategy, because it is not possible to predict the future and perhaps it would not count with the elements to face it, that is the reason why the agent remains linked with its plan, in spite of having a blurry vision of the situation.

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POLL

This poll aims to identify the impact of the breakdown of a plan and establish the emotions felt by the agent in this process. The answers are personal and confidential; there is no right or wrong answers. Just be recorded for statistical purposes. The poll takes approximately 5 minutes.

Curricular Program ☐ **Enrolled Semesters** _____

Gender ☐ F ☐ M **Age** ___

1. From 10 persons performing plan, How many do you believe that generate a link with the plan?

Link associated with the time, money and other resources to plan design.

1	2	3	4	5	6	7	8		10

2. When you design a plan feels any link?

Link associated with the time, money and other resources to plan design.

Yes ☐ Not ☐

3. Do you feel distress when a plan designed by you, can not be executed faithfully?

For plan refers to the shceme of a set of activities which takes you to a specific predetermined goal. Example: the plan to celebrate your best friend's birthday.

1	2	3	4	5	6	7	8	9	10

4. In relation to the beer game, Do you feel that the game should have continued?

Yes ☐ Not ☐

5. Do you feel that the unexpected ending of the game did not allow the full development of your plan?

Yes ☐ Not ☐

6. Please mention some feelings related with that unexpected termination that you experiment.

_____ _____ _____

_____ _____

7. Mark with an "X", what extent you faced these feeling when the abrupt ending of the game?

Feeling	Very High	High	Middle		Verry Low	Null
Denie the fact that the game is over.						
Get angry the arbitrary action of ending the game suddenly.						
Want to enter into bargains for play to continue.						
Feel sadness for the financial position remains.						
Resign to the situation.						
Joy because the game ended.						

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8. From the next list, indicate if you are agree or disagree with the following phrases.

	Strongly agree	Agree	Neither agree or disagree	In disagree	Strongly disagree
You consider that the plan can not be implemented faithfully and awakens feelings.					
You consider that your plan was almost impossible to fail; the cause of this is a trick.					
You consider necessary to reach an agreement with the coordinator of the game to allow continuity.					
You consider that when given the order to stop the game you identified that your plan was not so good.					
Consider that if an agent quickly discarded the obsolete plan, it will let you think about alternatives faster.					

We appreciate your feedback!

APPENDIX

Appendix A: Poll to evaluate the feeling after the abrupt end of the beer game.

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The Organization Of A Problem-Based Group Learning Session

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Abstract
The outcomes of approbation and implementation of the advanced educational technology based on the project method of the group consisting of 15-25 students in the teaching process are presented. The concrete practical recommendations concerning the lessons conduction in the problem-based format are made. The lessons based on the problem-based principle encourage every student to take part in the cognitive activity. The stages of lessons conducting in the problem-oriented format with different level of sophistication (complexity degree) (the operation with the information in the form of entire (compact) text and test tasks) are considered. It was shown that the basic fragments of the content of the academic subject are better and more efficient to transform through logically constructed system of test tasks. Such technique allows to work with the whole group of students and gives an opportunity to every student to put the problem in accordance with the students viewing. The solution of the same problematic situation can be different and may lead to different ways of its solutions, where.

INTRODUCTION

The development of the modern society occurs and develops in a dynamic environment (social, political, economic and etc.). New environment and pace of life with severe competition require new objectives and purposes in the field of education – to teach to make decisions in a nonordinary environment or in the environment with insufficient and uncertain information. Therefore, students should be ready to foresee and predict the development of the process and the rapidly moving events. The traditional teaching methods do not always ensure the shaping of thinking operations up to the standard. The students have some problems with the summarizing of the material, the statement and comparison of different points of view, drawing the conclusion. The analysis of the World Bank, carried out in accordance with students' level of cognition (learning curve) in 2004 (Krasnova, 2005), demonstrated that the students of the post-Soviet countries show very high results on the criteria "knowledge" and "comprehension", however, they have very low results on the criteria concerning "the application of knowledge in practice" and "the analysis-synthesis evaluation". The students from developed countries demonstrate high level of habit progression concerning analysis and synthesis, application of knowledge in practice and the skills of making decisions at relatively low level of "knowledge' criterion (Krasnova, 2005, pp.438-440). Therefore, the issue of getting qualitative education in accordance with international standards is very crucial today, which means not only the transfer of ready-made

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information in the subject (subject knowledge) but the training of methods and techniques to get knowledge, to understand the information, to transform and apply the obtained knowledge for further self-development (science). The transition from the static subject to dynamic science (scientific knowledge) means the teaching conduction as a comprehensive whole of knowledge on the basis of research approach instead of the education system based on knowledge delivery and information memorization. Teaching is considered as "a process of the development of students' thinking activity" – the development of the attempt to extend knowledge, to reveal the meaning of the content of the studying subject and to establish and comprehend the relation between phenomena and processes.

To encourage students it is necessary to create conditions to maintain students' interest to learning (Belomestnova, 2009). The students should consider themselves as researchers and pioneers in the field of knowledge, acquire skills to orient themselves in cyberspace and construct new knowledge from different scientific and technical and creative fields (Bordovskaya, 2011). It is possible to create such conditions by the application of project-based form of training. The project-oriented (problem-based) technology belongs to the leading educational technologies of the XXI century (Yalalov, 2007). By applying this technology the material mastering constitutes 90 % and it takes 30-90% less time to master this material, the teaching process is becoming creative which leads to the increase of students' interest to the subject. Teaching based on the project method is aimed at the search of problem solution (theoretical or practical one) by the statement of several certain, logically and content related problems. The themes (topics) of the projects are determined by the approved training program (syllabus of the subject or discipline) and are given by the teacher with regards to the learning group major (special subject). The project is carried out within a certain time period and with different participants/members (individual training, training in pairs, group training). At present individual training applying the project method is very popular and developed in different educational institutions. However, there is some lack of information, methodological development and practical use with positive outcomes concerning the group training. It is to be noted that the results obtained by different teachers regarding the use of the same method are also different. This is associated with different reasons. The main of them are: the number of class periods, the teacher's professional competence and the contingent of students. Therefore, the information and data referring to the problem solution of theory and practice of the project-based training in groups up to 15 students is vital.

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THE STUDY

This paper presents the results of project-based forms of senior pupils' training in gymnasium on the course syllabus "Technology. Ecological chemistry" (natural science profile, 9-11 form, 15 pupils in each group). The lessons are conducted in the project-based format. The developed course is a preliminary and transient stage to the further successful learning activity of the engineering students. The approval and experience period of the training using the project-based method concerning the solution of important and crucial ecological problems with the application of knowledge, skills and habits in chemistry is accounted for the pedagogical reasonability and appropriateness: the main educational component of the subject "Chemistry" is the simulation and transformation of models (formulas, equations, schemes, algorithms, and etc.) and the possibility to obtain convincing proof through the experiments. The circumstances allow to develop students' self-dependence and thinking activity and transform the obtained knowledge of a certain subject into person-meaningful one, to understand and give a meaning to the reality in the complex together with cause-effect relationship, to generate subjective attitude and understanding of the actions expedience, to master the confidence of his/her knowledge and the opportunity to realize physical necessity in self-actualization and self-expression.

FINDINGS (Results and discussion)

The vital problem of cities and towns, namely, their technogeneous pollution and the quality assessment of environment was chosen as the key project topics. This problem was the topic of three projects which included the transformed in the appropriate way information delivered by the instructor (teacher) to the students (pupils): the occurrence, indication and elimination of mechanical, physical, biochemical, and chemical contamination of the soil, plants, water resources, air, and snow cover. The topics of the projects are as follows:

1. The impact of fuel stations, car parks and industrial plants on the quality of spring water (organoleptic and chemical properties of drinking water); provision of the necessary facilities and safety of springs; the condition of garbage recipient in dormitory areas.

2. The pollution of air and soil by motor transport. The investigation of average daily dust load and gas contamination (passability of vehicles, the condition of motorways, chemical analysis of snow cover and swab of leaves), biochemical indication of the soil cover (mechanical composition of the soil and the analysis of the ionic composition of soil- water extract).

3. Inventory of green plantations condition in parks and public gardens of a city (mapping

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of the quantity and species of plants composition, the analysis of the external cause of disease of the plants, the assessment of the survival rate of different species of plants in typical geochemical conditions, the recommendations concerning the recreation areas of a city).

Teaching on the basis of the project technology possesses a productive character type and contributes to the performance of all teaching functions (educational and developmental ones), which is confirmed by the following criteria of activity and cognition progression, stand in life and confidence in his/her own abilities:

- pupils (students) have organized an action "Green shield of the gymnasium. This activity was devoted to the transplanting of green plantations of a certain kind and type in accordance with the recommendations developed by the students (pupils);

- the results of the developed projects were presented at ten city, regional, national and international conferences: seven first, second and third place diplomas were received and ten articles were published in the collection of the conferences;

- one article was published through publishing house «STT» as an electronic publication (edition) with ISBN number 5-93629-362-9 and was implemented into the educational process in several educational institutions (8 certificates of implementation were received);

- two works got All-Russian and International recognition (one was presented at All Russian Olympiad and became a bronze winner, the other one was presented at the III International television festival of scientific-educational programs «Intellect of the XXI century»);

- one student (pupil) who worked effectively on the project-based method was awarded with the title of "Laureate of Tomsk Oblast (Region) in the field of education, culture, science and public health" for the achievements in learning;

- all high school graduates of the specialized course entered different universities and graduated successfully from these universities with promising job perspectives.

These positive results were achieved from our point of view thanks to the lessons conducted at different level of sophistication (complexity) in the project-based format.

The suggested thesis can be considered more thoroughly in the following way. The problem-based learning requires from the teacher to encourage students' involvement in the problem situation at every lesson. The teacher's objective is to create a problem-based scenario of the lesson with presenting information requiring brainstorming and solution of this problem situation in a structured and systematized form. The type of the problematical character as well as the level of sophistication (complexity) can be different (Anikushina, 2010):

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The first level - the teacher delivers the teaching material, determines one problem situation (choice, uncertainty, conflict, contradiction, suggestion, denial) and shows the ways to solve it;

The second level - the teacher creates a problem situation and the pupils (students) together with the teacher do all the best to find the ways of its solution. The teacher shows different ways of hypothesis testing, the students (pupils) deduce the logic to find out whether the evidence is reliable or not;

The third level - the teacher creates a problem situation and the pupils (students) find the solution of the given problem themselves;

The fourth level - the teacher presents random indigested initial data and the students (pupils) pose a problem and find the ways of its solution.

Therefore, at the first lessons the students' task was to master the techniques and methods that can help to cope with the text (the detection and abstracting of the key information, coding and decoding, analysis and division of the information, synthesis and summarizing through the comparison, the assessment of information value). The techniques concerning the transformation of the entire (compact) text into a short and concise one provided by special video images ("mental maps", where the text is transformed in another information field in the form of schemes (diagrams), "log book" with the preparation of a functional synopsis (abstract), «conceptual or plot table» to structure the material in the form of tables and etc.). The objective of these lessons was to develop representational thought and visual-efficient intelligence, the ability to present any information (even the most complicated one) in a compact, visual and clear form. The example of this kind of lesson is described in our publication (Ikonnikova, 2015,pp. 1-7). These types of lessons create the most comfortable environment for person's liberation and are good for showing his/her creativeness and initiative.

After habit progression concerning the operation with a text the level of sophistication (complexity) of the problem-based scenario is getting higher. The main concept of the lessons at the fourth level is as follows: the teacher describes briefly the problem situation and provides the students (pupils) with minimum information on the specified topic (theme) in the form of random indigested initial data. Using this information the students (pupils) should pose a problem and find some relevant ways to solve it. Upon our practical experience we came to the conclusion that the best way to present this information is a test which includes the description of inward and outward nature of the concepts (properties or a role for a situation). Conciseness and laconism of the test task simplifies the comprehension and

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interpretation of the terms in the subject field. This is very important when you have to present and deliver a great deal of teaching material when the number of class hours is limited. Doing these test tasks the student (pupil) summarizes the data and extracts the key information which helps him/her to pose a problem and find the ways to solve it. The pupils find the facts and then the discussion will be conducted on the basis of these facts. As a result new knowledge will be produced and presented in the form of a certain algorithm. After that, applying different methods and techniques the students (pupils) process the facts (acquired by them) and produce new knowledge themselves. The presentation of the information in the form of the test tasks contributes to faster, easier and more durable knowledge acquisition and skills mastering since the knowledge necessary to master is presented in a structured and systematized form. Thus, the objective of learning and the significance of knowledge acquisition are clear, the basic habits concerning the culture of thinking and intuition are being developed (Mikhajlova, 2011). The best test tasks in the format of one lesson are tests with the choice of more than one correct answer (Chelyshkova, 2002). The lesson based on the above mentioned format are more flexible, allow to work with the whole group and give the opportunity to students (pupils) to pose a problem in accordance with their own point of view and opinion. The same problem situation can be solved differently and results in different ways of solution, where each solution is correct in accordance with the chosen criterion.

CONCLUSIONS

The article considered the stages of lesson conducting in the problem-based format with different level of sophistication (complexity): the operation with information in the form of entire (compact) text or test tasks. It was shown that the development of the set of test tasks on the specified topic of the subject with the choice of more than one correct answer allows the teacher to work and cooperate with the whole learning group. Therefore, the pupils (students) have the opportunity to formulate the problem in accordance with their own point of view and find different ways to solve this problem, where each way is correct in accordance with the chosen criterion. Alternative information presentation at every lesson ensures active participation of the whole group in the interesting, creative and efficient process of the development of thinking and the personality, contributes to the formation of self-confidence, makes possible to choose the project theme and to find all required material for the completion of the project. The recommendations of conducting lessons in the problem-based format in a learning groups presented in the article can be used as a methodological

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material for other teachers where each of them can find appropriate facts and develop his/her lessons in accordance with the advanced educational technologies.

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The Strategic Approaches In Quality Of Engineers Training

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Abstract
The strategic issues of quality training of engineers for the aerospace industry are discussed at the example of the Siberian State Aerospace University. The features of aerospace education implemented at the University are closely linked with the production work of students on the basic for the University high-tech space enterprises and scientific work in the research institutes of the Russian Academy of Sciences and are reflected in the curricula of relevant specialties. In the process of training of engineers one of the main tasks of the university is to create an effective system of quality training of engineers which are competitive in the labor market and are able to continually improve their professional skills. The strategic objectives can be achieved as a result of the implementation and maintenance of a quality management system aimed at continuous improvement of the university activity in order to meet the needs of all stakeholders. The involvement of faculty and staff in the implementation of the strategic objectives of quality training of engineers forms the basis of the methods and tools realization of corporate management of the University and its subdivisions.

1. The Basic Principles Of Engineers Training At The University

The Siberian State Aerospace University (SibSAU) trains engineers for the enterprises of the rocket and space industry. A distinctive feature of being implemented at the University of aerospace education is an integrated training of specialists, known in the country as a system of "Plant-University", based on a combination of theoretical learning with practical work on the high-tech space industry and scientific research in academic institutions, as reflected in the curricula of relevant specialties. The strategic mission of the university is to promote the dynamic development and higher competitiveness the Russian space industry in the global market space, strengthening the country's defense through the advanced development of human resources, research and innovations to ensure the create a new generation of space vehicles and systems. The dynamic development of the university and increasing the quality of training is ensured by the continuous improvement of the educational process, the introduction of modern educational technologies, the development of basic and applied scientific research and its use in the educational activity.

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The Space Information Systems are the main priority, in which the University holds a leading position in Russia in training and research related to the development and modernization of the domestic space information systems, improvement of spacecraft (SC), systems and complexes for various purposes, fixed and mobile communications, television, navigation, geodesy and retransmission (Kovalev & Loginov, 2012). On the basis of scientific and educational centers, established jointly with the basic industrial enterprises and research institutes, the team of students and young scientists is working to establish a series of technological research and educational small satellites (SmalSat) and carrying out the scientific and technological experiments in space (Kovalev, Loginov & Zelenkov, 2014). For example, the structure of scientific and educational center "Spacecraft and Systems" (SEC S&S) includes the Student Design Bureau for the design of small satellites, "clean room" for the assembly and testing of small satellites, laboratory of prototyping and satellite electronic systems, laboratory of mechatronic systems and precision mechanics, which equipped with modern high-precision control, measuring and test equipment. The SEC's equipment enables the assembly and testing of satellite mechanical systems, electronic equipment prototyping, conducting vacuum and climate tests, researching spacecraft electronic equipment (Kovalev, Loginov & Zelenkov, 2015). The students take part in the manufacture of small satellites. Two student satellites "Jubilee" and "MiR" are currently on the space orbit. The monitoring and operational control of the small satellites is performed at the students' Satellite Control Center (SCC), which is located at the university. The students' SCC is equipped with a special transmitting-and-receiving hardware-software complex; this device enables real-time automatic and manual flight control of the university's small satellites (Kovalev & Loginov, 2011).

The content of education in SibSAU is submitted by the combination of following components:

- Training ensuring assimilation of the basic, general and specific professional knowledge;
- Education, providing, along with training, formation of methodological culture graduate, possession of methods and means of cognitive, professional and communicative activities;
- Learning during which the blocks of psycho-pedagogical disciplines are inseparably inserted;

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- Practice-based learning, in which the senior students pass an industrial practice at enterprises, thereby directly involved in the enterprise work.

In the process of preparation of engineers one of the main tasks of the university is to create an effective system of quality training of engineers, which are competitive in the labor market and are able to continuously improve their skills. The strategic objectives can be achieved as a result of the implementation and maintenance of quality management system aimed at continuous improvement of university activity in order to meet the needs of all stakeholders. The university administration seeks to achieve the unity of purpose and directions of development the quality management system of educational services, to create the internal environment of corporate management, which allows all faculty and staff to be fully involved in process of achieving the strategic goals.

Consider the basic principles of quality management of educational services and training of engineers.

1.1. Orientation to the consumers of educational services

The University is focused on the needs of our customers, consumers of educational services. Engineers are in demand in aerospace industry. It is important to properly evaluate the need for specialists in the present and in the future.

1.2. Involving employees in management processes

The involvement of faculty and staff in the implementation of the strategic objectives of quality management system of educational services is the basis of realization of the methods and tools of corporate management of the university and its subdivisions. This makes it possible for university administration to exploit the potential of staff to the maximum benefit for the university, students and customers.

1.3. Approach to management as to a process

The management of educational activities should be implemented as a process in order to achieve the most effective results. Improving the system of management at the University is also dictated by the increasing role of globalization and strengthening the social and economic relations in the world, a growing trend of interdependence and interaction in the context of

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developing technology, to integrate knowledge and values, which in turn leads to mutual influence on the events taking place in different regions or countries.

1.4. A system approach to management

The identification of educational processes and management of it should be provided as a single system to improve the effectiveness and efficiency of the university in achieving its strategic goals.

1.5. Continuous improvement of the quality system

For meet the needs of students receiving educational services at the university, should be effectively implemented the principle of continuous improvement of the quality management system of education.

1.6. Making decisions based on facts

To achieve the efficiency of decision making in the quality management system of educational services it is necessary achieve the principle of normative and legal consolidation of decision making.

1.7. Mutually beneficial relationship with trainees and customers

At present, the important is the practice of building long-term mutually beneficial relationships with key partners present in the labor market. The enterprises of industry try to build long-term, trusting, mutually beneficial relationship with the university. The creating of long-term relationships with our customers, meet their needs and providing them with the necessary quality specialists is the basis of relationship management strategy with the enterprises of aerospace industry. To ensure the effectiveness of the quality management system of University's educational services is necessary to conduct ongoing monitoring of the system (with the analyzes and suggestions for continuous improvement) that will facilitate the development of mutually beneficial relations between the university, students and enterprises - customers.

2. THE DEVELOPMENT OF A QUALITY MANAGEMENT SYSTEM

The system for ensuring the quality of training should be planned and implemented on the basis of the complex development programs of the University, which are developed every five years and adjusted annually. A complex program to improve the educational activities is

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developed in framework of the "Complex Development Program of SibSAU". The development of a quality management system at the University requires the development and implementation of special program "Quality Management", which is to integrate major events for the development of implementation methods of the University Strategy in the field of quality management of educational services and engineers training.

Here it is important:

- Preservation of historically accumulated potential to manage the development of educational and scientific technologies and implementation methods, documented in high school in the form of standards, methodologies and other materials, their modernization and harmonization with international standards;
- Providing a common information space for all faculty and staff of the University in order to create and organize of an effective quality management system;
- Development of principles and methods of motivating teachers and university staff to move to the system position of quality assurance of educational services;
- Ensuring the necessary and sufficient educational level of teachers and university staff for the effective realization of the quality management system of specialist training;
- Ensuring continuous improvement of the quality management system, harmonization of internal and external processes, guaranteeing a high level of training.

The great attention in promoting and evaluation of the education quality is given to the monitoring system of education quality, which is effectively used in the university. The particular importance is the analysis of the results at the end of the last training course (Fig. 1). To determine the response of students on a course of study at the University actively used questionnaires students.

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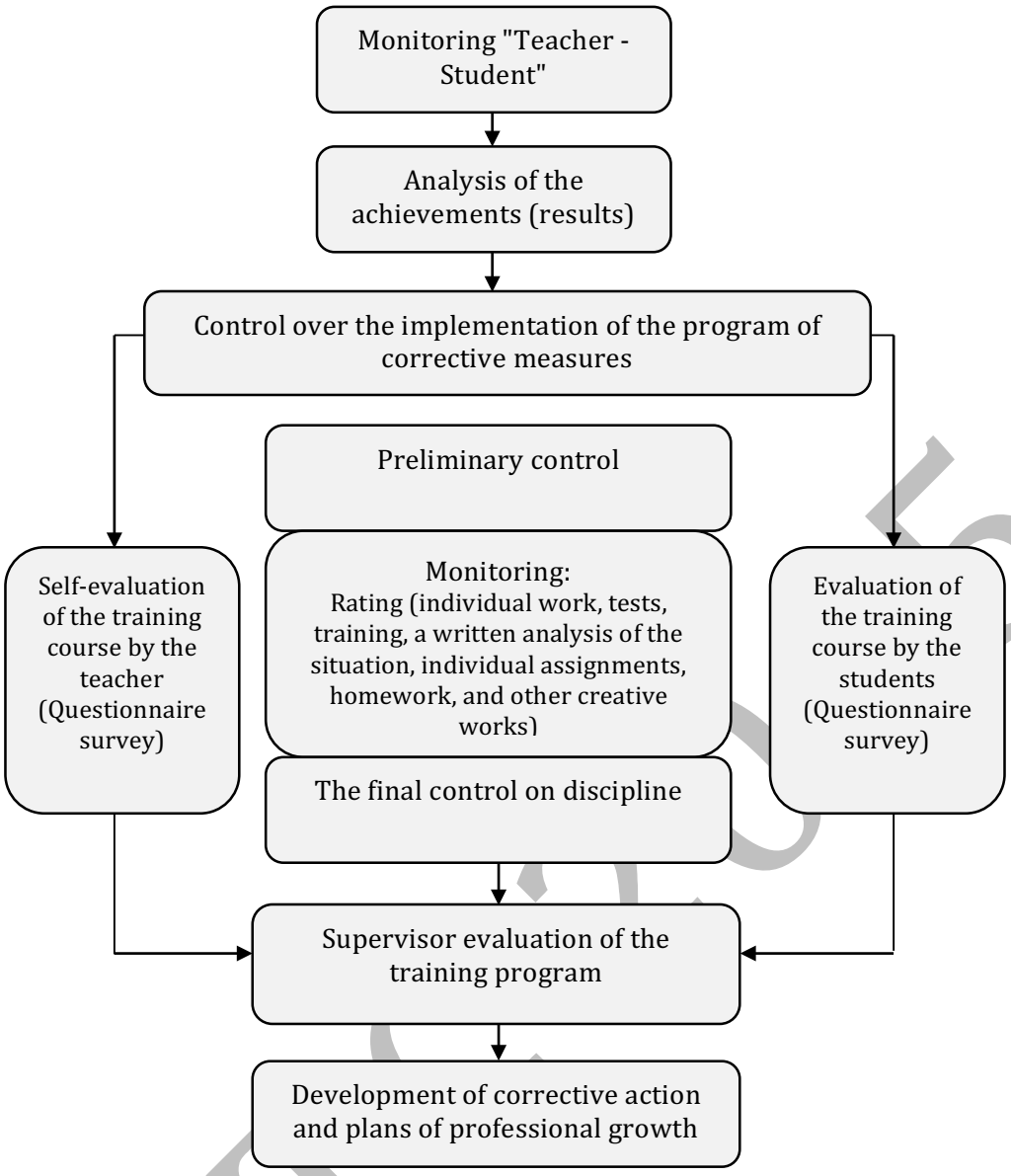


Fig.1. Main elements of the system of monitoring the quality of education

Here are the objectives arising from the strategy of the Siberian State Aerospace University and defining policies, practices and safeguards to ensure the quality of educational services and training of engineers:

- Addressing the needs of students, industry and society;
- Ensuring the integration of scientific research with educational process;
- Creating a quality management system of educational services implementing the principle of continuous improvement;
- Ensuring the development of the material, methodological and information base, ensuring the implementation of all the processes of the quality management of the University;

- The creation of a single legal space, its harmonization with the laws of the international community to ensure the effective functioning and development of the management system of educational services;
- Ensuring internal and external quality assurance of the educational services and training of engineers;
- Implementation of the international quality management system certification of educational services.

The implementation of the strategy allows you to:

- Increase the responsibility of the faculty and staff of the University in the quality of educational services;
- Make a quality management system of educational services unified and transparent for all university employees and students;
- Increase the motivation of all teachers and staff to quality work and rally the team around the idea of the training quality;
- Enhance the credibility of the University on the domestic and international markets;
- Increase the financial attractiveness of the University for investors.

The internal guarantees of the strategy implementation:

- Traditions of the University;
- Effective functioning of the quality management system of specialist training;
- Continuous monitoring of the all processes of training and adjustment of a deviation;
- Implementation of the principle of continuous improvement of the system of quality management of educational services and engineer training at the University;
- Continuous updating of the quality manual, a set of documented procedures and work instructions in accordance with the requirements of international standards;
- Regular internal certification of student and teacher jobs.

The external guarantees of the strategy implementation:

- Holding of the external advisory audits of the quality management system of educational services from the internationally renowned consulting companies in the field of quality management;

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- Ensuring of the planned phased international certification of the University quality management system;
- Performance of the planned upgrade of Russian and international licenses for educational activities.

CONCLUSION

The implementation of the strategic approaches in the field of quality of training allows raising the quality and effectiveness of training engineers for the aerospace industry in accordance with the requirements of the market and the strategic directions of the region development.

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The Team Project Method In Managers Training

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Abstract
Modern managers' training today is carried out in a rapidly changing environment. Especially important competencies for managers are the ability to respond quickly to environmental challenges, to make appropriate decisions and to communicate effectively in their team. All of these competencies can be fully developed in the team project framework. The authors believe that their experiences of intercultural management and global economy teaching with the help of the project method are proving this point.

INTRODUCTION

Many researchers believe that the main purpose of education is to create people who are capable of doing something new rather than simply repeating what other generations have done. One of the educational goals is to form minds which can make decisions and analyze information, not simply take everything as given. These competencies are especially important today at the present stage of international economic and political relations development.

One of the methods that help to shape a creative and resourceful specialist is, in our opinion, a projects method. This method has emerged in the early 20th century in the United States, its author was a philosopher and educator John Dewey who believed that we know only that and only when we are actually able to do changes in things by our activity, that can confirm or refute our knowledge. Without this knowledge are just a number of conjectures. His disciple and a follower, the prominent representative of progressivism, W. Kilpatrick, suggested the project method as a way of organizing such activities. In parallel, in 1905 in Russia teacher S. Shatsky started his work on the introduction of project learning, these ideas were developed later in a Soviet pedagogy by P.Kapterev, P.Blonskiy, A.Makarenko. However at that time, as in many countries such as the USA, the UK, Australia, Italy, Finland, France, Germany and Belgium, Dyuik's ideas were supported and widely used, the project

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teaching method in Russia in 1931 was banned and its active use came back only in the 90s of the last century.

As basis for the projects method is the development of students' cognitive skills: their ability to design their knowledge independently and to navigate in information space, as well as creative and critical thinking development. Project-based learning always involves solving particular problems which envisage the application of systems analysis and interdisciplinary approach. Results of completed projects should be "tangible", i.e. if it is a theoretical problem thus its concrete solution should be developed, if a practical one – its specific outcome, ready for deployment.

All projects are equally focused on specific goals, time limited and assuming coordinated execution of interrelated activities. The project begins with a project assignment design (defining the subject, teams' formation, targets and problems determination to be solved), project's development, outcome formalization, presenting results and reflection. As we know, same functions are carried out by managers: planning, organizing (coordinating), monitoring and analyzing results of the project, so the use of the project method in managers training, in our opinion, is particularly relevant.

The most significant, in our view, are the interdisciplinary group projects, such as the University of La Laguna (Spain), where projects included writing of business-plans by multidisciplinary student teams, studying chemical engineering, industry, construction, computing and business management areas. As a result, after participating in this project students are more interested in running their own business in comparison to the total population of Spain. (Francisco J. García-Rodríguez, Esperanza Gil-Soto, Inés Ruiz-Rosa, 2012). Similar projects analogues can be found in the Soviet higher education practice, on the example of the implementation of joint projects by TPI students and young scientist from High Voltages Research Institute and in the practice of Russian higher school with the example of business incubators created generally next to technical universities.

THE STUDY

We represent an educational institution which has been carrying out training of Bachelor and Master Degree Management students majoring in "International Business" for more than 20 years. From year to year the quantity of subjects using the project method in

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"Management" specialty curriculum only increases. Wherein, since it comes to the managers training, for whom team work competence is mandatory, projects implemented by students are commanding. The project method used in the studying of such subjects as "Creative projects", "Psychology of a Leadership", "Business-planning", "The world economy and foreign trade activities", "Intercultural management" and others as well as "The art of a presentation", in the framework of which students learn how to present results of a group project work. The "Project Management" course completes future managers' methodological training concerning projects development and implementation.

We assume that the project method is the fundamental method in the managers training process. Considering the fact that our graduates work in diverse areas like governmental agencies, oil and gas industry, small- and medium-sized business management as well as starting their own businesses including innovative ones. At the same time, business is generally focused on the international market so the key competencies for students are the ability to solve intercultural communication issues as well as foreign economic activity problems.

FINDINGS

Within the framework of the intercultural management course fourth year Management Bachelor students study different countries' business cultures, taking into account their measurement tools based on the methods of the Dutch explorer G. Hofstede, British scientist R. Lewis, Dutch scientist F. Trompenaars and American anthropologist E. Holl. To understand the differences among business cultures, students work with a collection of case studies and at the end of the course they carry out the team project which aim is to develop the ability to solve intercultural communication problems using tools that have been proposed during the study. Group of 22 people is divided into 5 micro groups of 4-5 students. The team leader is defined, who is the project manager in the future. The project manager distributes power among team members. Firstly the goal and objectives of the project are determined. It is to make recommendations to address potential problems of intercultural communication in the framework of a real international project on building a gas pipeline to China. The theme of this project has not been selected by chance. The head office of the company implementing project "The Power of Siberia" is located in a city where students are studying. The objectives of this project are:

- to study the project "The Power of Siberia";

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- setting off the focus groups;
- conducting research according to a selected method (each group determines the research method itself);
- recommendations development to overcome intercultural communication problems in the international project framework.

It should be noted that start of the project work and it's presenting takes place in the presence of the implementing the project company's manager, which is an additional motivation for students to show qualitative performance. During "The Power of Siberia" project's presentation some technical characteristics of the project, deadlines, costs, as well as possible risks and project's stakeholders were introduced by the representative. A project team had to identify focus groups within this project and to determine what problems may arise in the process of their interaction. By all the teams three groups of peoples involved in the project "The Power of Siberia" were identified - a northern peoples of Russia (Yakuts, Evenki, Evens, etc.), Russians and Chinese. Using questionnaires based on the E. Hall, G. Hofstede, R.Lewis and F.Trompenaars works students conducted a survey among those focus groups and revealed possible contradictions in the interaction of different cultures. The total number of hours spent on the project - 36, including project results presentation and analysis of the work done. The project reference was given for every 6 hours of the work process, after results of the work done in a given period of time were summed up so a teacher could monitor outcomes and have a correct estimation of each participant's contribution, and the team at the same time were given the opportunity to be informed about the project progress. The importance of communication between team members should be mentioned. It's not only the collaborative work in and outside of a classroom, but also communication by phone, e-mail, Skype and through other information channels. Evaluation of each team member based on the results of the project is sufficiently complex. A particular challenge in the evaluation process is a collectivist type of business culture in Russia. Therefore an objective evaluation of each team member's real contribution to the project it's one of the problems that has to be addressed while using the project method. In accordance with the regulations of the university, a maximum of 60 points can be given for a project. Projects estimation is proceeded by a commission consisting of three department's professors and company's employee. A final mark for the project included three components: commission estimation, teacher's estimation and evaluation of the each participant contribution according to team

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members' opinion. Commission assessed each project the maximum of 60 points for the next criteria: a content, a presentation, answers for the questions given. Teacher marked students according to the results of the project work throughout the whole course. Each team member defined the degree of participation coefficient for his team members on the following criteria: number of working hours, difficulty of the task, creativity. This assessment was summed up and divided by the number of group members. Thus, we obtain an average score.

During studying a course "The global economy and foreign economic activities" in the first practice seminar students are encouraged to work in groups and choose which countries are expected to cooperate and in what area. Teacher can help them to make the correct choice on all of the three matters by proposing a set of criteria:

- For example, if team consists of three people, what functions are required (moderator, timekeeper and ...)? Should each team member possess all the competencies or can you use the labor division principle?

- Selection of a country (company) for the cooperation can be done according to next criteria: work experience in the city (region) with companies from this country, the presence of a high trade share with this country, a need to diversify business, "just wondering" etc.

- Selection of cooperation areas: trade, investments, technology transfer, tourism and others. Here the criteria can be directed by scientific or research activity of students, personal interest, self-owned or family business, etc.

Let us describe one of the group's project. It consisted of five people, students decided to organize an educational tourism receiving company in the city of Tomsk focusing mainly on European countries. Project goal was to justify the economic benefits from creating such kind of a company. We need to specify that this project was planned three years ago. Such a project would hardly have appeared at the end of 2014. The collapse of many Russian tourist companies on the outbound tourism market is likely to be viewed by students as an inevitable and key risk of such a project.

The world economy course is aimed at studying the markets, particularly trade market, production factors markets (labor and capital) and currency markets. Part FEA (Foreign economic activities) course is divided into two components:

- international and national legislation in the scope of foreign trade;

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- National regulation of this sector (legal and organizational).

The study of the good market requires students to find out what trade theory is the most appropriate for the touristic business and gives the most accurate description. They have to choose one of those theoretical concepts that are offered by teacher on the lecture or the one from the list of resources recommended to justify their decision orally in a practical class (seminar) and in writing (while compilation of the project report). In particular, the course examines international trade theories of Smith, Ricardo, Mill, Marshall, OCs, Vernon, etc.

While studying the section of "International trade practices" students learned the standards of the World Trade Organization (WTO) a member of which Russia has become. To implement the project following questions have to be answered: What preceded the WTO? In which way tourism market is regulated in this organization? What is a "tourism service", what are the "means of its delivery"? Which countries are the leaders in the market of the host tourism? Which companies are the competitors providing services in the educational tourism market? What is the dynamic of the global tourism market and the world market of education? What are the main and complementary services, and what is the role of the World Tourism Organization and methods of market regulation.

The next project's phase was to find out if there is a need for hosting tourism in Tomsk. In order to do this a questionnaire was developed, using the capabilities of Google it was sent it to various countries in Europe and Asia (more than 15 countries). Countries choice was determined by the fact that they were the countries where students of Tomsk Polytechnic University (TPU) can participate in horizontal academic mobility programs and which TPU signed an agreement on academic students exchange with. TPU signed bilateral agreements on academic exchanges with 72 universities in 22 countries. (Hadzigeorgiou Y., Fokialis P., Kabouropoulou M., 2012) Questionnaires received made it possible to determine the potential capacity of the company's market, i.e. take into account the number of students who are interested in studying in Tomsk and how much they are willing to pay for this service. Definition of market capacity required knowledge of international marketing, so that such activities require additional information search and it makes this project more interdisciplinary.

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The outcome of this phase of the project had been PowerPoint group presentation, which also included the question's answers; afterwards according to these results presentations students were receiving interim attestations for their work.

Further it was necessary to define a set of resources required: financial as well as human ones. For the formation of knowledge, abilities and skills in this part of the project it was necessary to study:

- international market of the capitals;
- international labor market.

Certainly, neither international capitals market nor world labor market are not limited with needs of the tourism market only, so students had to look through theoretical and organizational basics of these markets very carefully. Assuming the international capitals market, next criteria were identified by students according to which the market is divided into:

- terms: short, medium and long-term investments;
- sources of origin: official and private;
- investments objectives: entrepreneurial and loan;
- others.

The main objective of the study of a market for the project was to identify possible sources of funding for the project: it is a private business, national or international tourist part of the company? Can they take a loan, and if so, where from? From national or an international bank? There they also met with the structure of TNCs found what may be the degree of foreign ownership in the company, i.e. able to distinguish between a branch, subsidiary and associated companies.

Further students were introduced to the "rules" of international investing by IMF methodology, what enabling them to understand basic risks of international investments: nationalization, expropriation, defaults, etc.Students had to justify their choice based on the three criteria: ownership of a company, a bank - lender of the project, the currency of the loan and the availability of trade and economic relations with a country, respectively, several options of financing the project were formed (Table. 1)

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Table 1: Criteria for selection of a company.

	Propertyof a company	Lending bank	Currency of a loan	The presence of trade and economic relations with a country
	Foreign companies operating in Russian Federation	Foreign	Foreign (US dollars)	Required
	Foreign companies operating in Russian Federation	Russian	Foreign (US dollars)	
	Foreign companies operating in Russian Federation	Russian	National	
	Russian	Foreign	Foreign (US dollars)	
	Russian	Russian	National	

As a result, the company selected was 100 percent national and it was expected to make a loan from a Russian bank in Russian rubles.

Undoubtedly, it is important to identify effects of international capital markets and labor use for a national company. To actualize the course, students were suggested to evaluate the reflection of these problems in the art, in particular:

- To read the following books: M. Saltykov-Shchedrin "The Golovlevs"; Triolet Elsa “Roses à credit”; Theodore Dreiser "Financier"; Leslie Waller "The Banker"; etc .

- To watch the following movies: “Iron Road”, “Wall Street Money Never Sleeps”, “Bread and Chocolate” and others.

Familiarity with these sources provides additional visualization and artistic means to evaluate absolutely accurate economic risks.

Students have to prove the justification of their choice in writing and orally by preparing a public speech.Companies operating in foreign markets are facing at least two risks: currency (changing of a legislation and currency rates) and political one ("How to get befriended with someone to the detriment of the other"). As part of currency risks learning students study monetary policy of a country (his/hers and partner’s), main goals and features of currency regulation, learn to evaluate the effectiveness of various instruments of monetary policy and exchange rate policy. An important part of this section is to familiarize with the way world’s and regional currency systems are arranged. Here an appropriate recommendation would be to read a book of Erich Maria Remarque "Three Comrades", which very clearly shows what

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efforts are taken by businessmen and how they may be futile against of galloping devaluation of the national currency.

The next stage of the project - preparation of a contract. Russian legislation, as well as international one, makes recommendations for writing (drawing up), design and structure of foreign trade contract. It is very important to take into account a partner-country, as names and units of measurement for same product in different countries may vary. Reducing the risk of illiterate contract registration requires its careful writing, probably its expertise in authorities which promote start-up businesses - in Chamber of Commerce, different consultancies, etc. Within the project framework a list of such companies had been created by students, including the "Tomsk state university legal polyclinic", where they received counseling.

One of the key points of the contract are the monetary and financial conditions and, in particular, the terms of payment. As part of the project, students had been forming alternatives of foreign trade contracts payment methods which are permitted by national legislation and a country banking system. Thus, the project is completed with studying customs and banking legislation. Students had an opportunity to compare features of supply or conversion of goods in the country or abroad, using knowledge of customs regimes which are possible to use in the Russian Federation and in the countries of the Customs Union.

The project included costs estimation within the country for tourists' accommodation and food, taxes, renting classrooms, staff salaries and other expenses to form the price of a tourist product.Students evaluated their work as very fruitful, since, in their view, the work on the project allowed them to see the connection between theory and practice.As a rule, the project ends with a meeting with representatives of one of the three organizations: customs house, foreign exchange department of a bank or a chamber of commerce or a businessman - participant of foreign economic activity.

CONCLUSIONS

As shown by the above-described experience of the project-based learning methods they arouse students' interest in learning and cognitive activity that allows to create an atmosphere of motivated and creative education. According to a survey of students on how much are they satisfied with this form of conducting classes, 78% said they are very satisfied, 94% said their

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learning process of this course completed successfully, 94% said there is a high relevance of the knowledge and the possibility of their use in their future careers, 61% would like to continue exploration of intercultural management and foreign economic activities in their research activities.

Thereby, summing up the above, we can conclude that the project method application allowed not only to arose a keen interest to the studied subject, but also to develop the following competencies, that are necessary for a competitive manager in the international market of intellectual labor:

- organizing teamwork to solve management problems;
- building oral and written language logically correct and offering clear arguments;
- conducting business communication: public speeches, negotiations, meetings, business correspondence, electronic communications;
- critical assessing personal strengths and weaknesses;
- using a foreign language in interpersonal communication and professional activities;
- setting goals and formulating tasks, associated with professional-functions implementation;
- analyzing and designing an interpersonal, group and organizational communication;
- making decisions and taking responsibility for them.

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The Use Of Blogs In Pre-Service Chemistry Teacher Education

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Abstract
Blogs support shared access and organization of information, the inclusion of multiple learning resources such as videos, images, and hypertext and hence, may expand teaching practices and collaborative learning arrangements. In this study, we examine the integration of blogs into the pre-service chemistry teacher education course at the University of São Paulo, Brazil, with the aim of evaluating its effectiveness in preparing future teachers for their profession and improving their Information and Communication Technology skills. To do so, we built a blog using a platform based on the WordPress system and implemented it with 13 trainee teachers in two years in the Teaching Practice in Chemistry. To analyze the pre-service teachers' impressions regarding the use of the blog in the course, we used Content Analysis Methodology. The findings show that the blog was used as a teaching resource and as a pedagogical strategy during the course. We discuss how the future teachers positively evaluated blogs for teaching.

INTRODUCTION

Information and Communication Technologies (ICT) have been frequently used in the classroom context in different disciplines to support learning and instruction (Sarkar, 2012; Peeraer & Petegem, 2012; Ramírez, Martín-Domínguez, Orgaz, & Canedo, 2015). ICT involve, among other aspects, the use of digital technology and communications tools (Luu, & Freeman, 2011), and can be used to structure activities and thus offer enhanced opportunities for active participation in science (Weinberger, 2011). Within the possible uses of ICT is the blog, which among others can serve as interactive/collaboration tool between the subjects involved in the teaching-learning process, to archive articles and comments of users and as individual reflective tool (Wang & Hsua, 2008; Uzunboylu, 2011).

The use of the Blog in the classroom can be favored if teachers are aware of this tool, are experienced their use and to become competent in using and managing educational technology (Barro, Ferreira, & Queiroz, 2008). One way of prepared the teachers is by training student teachers in educational technology during their pre-service teacher education (Smarkola, 2008; Shoffner, 2007; Pontes, & Castro Filho, 2013; Colwell, 2012). Pre-service teachers may be more willing than in-service teachers to learn and use educational technology in their classroom practices (Chai, Koh, Tsai, & Tan, 2011).

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In this article, we examined the application and implementation of a blog in a pre-service chemistry teacher education course, Teaching Practice in Chemistry Course, of a public university in Brazil, and evaluated the perceptions of pre-service teachers in the use of the blog. Thus, we seek to investigate to what extent the use of blogs contributes to the development of attitudes towards educational technology by pre-service teachers.

BLOG: APPLICATION AND CONSTRUCTION CONTEXT

The Blog was used for 2 years in the Teaching Practice in Chemistry Course of the University of São Paulo. The participants consisted of 13 trainee teachers (6 in the first year and 7 in the second year), a teacher and a mentor teacher, the later supporting the teacher with the course activities.

Learning Objectives. The course has the purpose of qualifying pre-service teachers to teach Chemistry at high school level. The course has 300 hours, wherein the pre-service teachers need to dedicate 120 hours to activities in the university with the teacher and the mentor teacher and 180 to a Teacher Professional Internship (PI). The Teacher PI provides the opportunity for pre-service teachers to plan, revise and teach chemistry lesson during their field practice. The PI aims to facilitate pre-service teachers to take full responsibility for a class, practice what has been learned at the university and develop insights into skills needed to perform the various functions and roles of a teacher.

The PI activities in the course were:

- observing Chemistry classes at the high school level in Brazilian secondary schools
- preparing experimental activities and didactic materials supporting the high school Chemistry teacher in their classes
- developing teaching skills through preparing lesson plans, teaching lessons and experiential learning of classroom management and
- offering and implementing a Chemistry course in the science museum Centro de Divulgação Científica e Cultural of the University of São Paulo. The website of the science museum is http://www.cdcc.usp.br.

Blog Implementation. Building on Brownstein and Klein (2006), the blog was implemented as extension of production space, for building and disseminating knowledge,

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beyond the co-present interaction between subjects. We analyzed four aspects for building the blogs: *a) choice of the platform, b) layout, c) privacy politics,* and *d) authorship.*

Criteria for the *choice of the platform* were the ease of use and accessibility and the possibility of the inclusion of documents, graphics, videos and other resources in the blog (Lefoe & Meyers, 2006). We decided for a platform based on the WordPress system (http://br.wordpress.org). The platform was hosted at the local webserver of the Research Group in Chemistry Teaching of São Carlos Institute of Chemistry (GPEQSC) (www.gpeqsc.com.br). Another important reason for choosing WordPress was that the system can be installed on any web server free of charge without employment restrictions. We chose a *layout* (Figure 1) for the blog that provided content in an organized manner in three areas: the top involved the identification of the subject, the main area included postings and the sidebar contained the menus and links to publications.



Figure 1: Layout of the Blog

As for *privacy politics*, we chose a private blog, namely, with restriction of access by passwords for viewing content, publishing activities, and reviews. As for *authorship*, we analyzed how postings could be published in the blog and decided to take the opportunity that everybody involved in the Teaching Practice in Chemistry Course acted as authors. The participants of the course accessed the blog every week on a regular basis.

Our objective with the blog use was to provide a support tool to be used in two areas: as a teaching resource and as a pedagogical strategy (Gomes, 2005; Gomes & Lopes, 2007). As a

teaching resource the blog can serve as a space to provide information from the teacher and to make it possible for the teacher to create and promote a space centered in the content approach, news and current events related to the subject he teaches. As a pedagogical strategy the blog can provide a form of digital Portfolio and a learning journal: in the digital form of portfolio, learners play a central role in the creation and promotion of blogs by posting their academic work; and in the form of a learning journal, through the reflections of their postings regarding learning in their class. Figure 2 summarizes the activities taken on the blog of the Teaching Practice in Chemistry Course in the use of perspective as a teaching resource and as a pedagogical strategy.

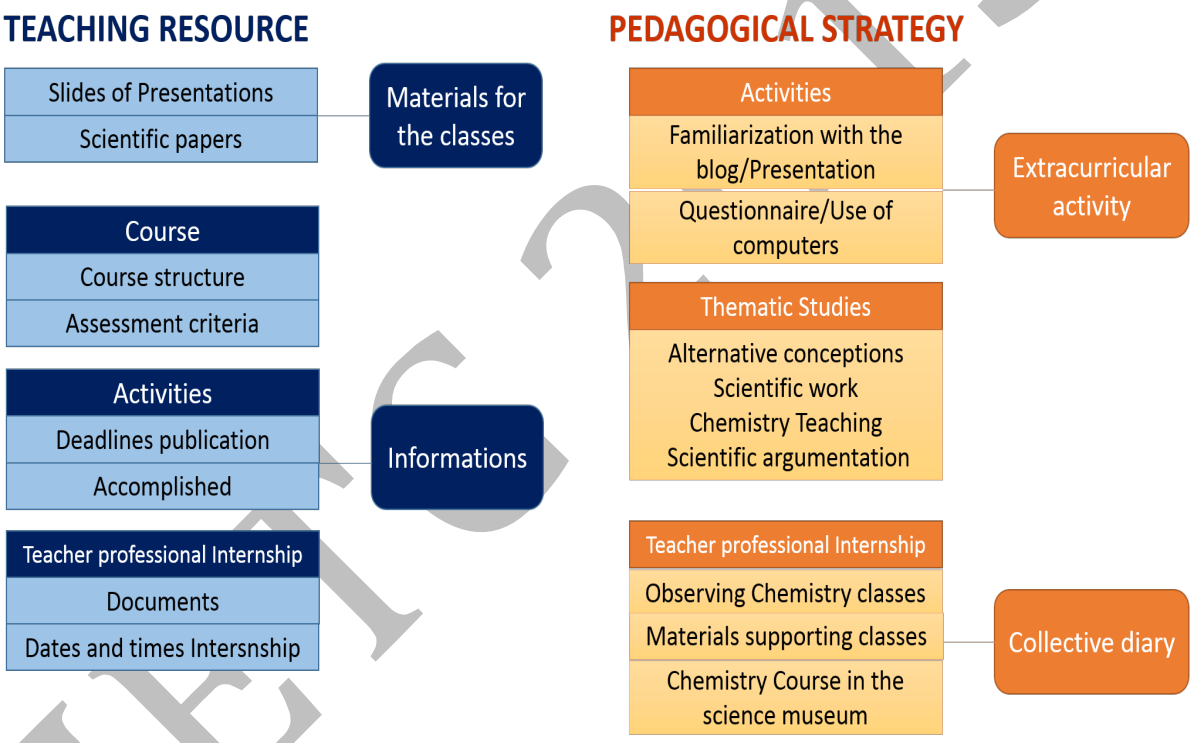


Figure 2: Schematic diagram of the organization of activities taken on the blog in the use of perspective as a teaching resource and as a pedagogical strategy.

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BLOG: AS A TEACHING RESOURCE

The blog was used as a place for the teacher and the mentor teacher to provide materials for the classes and information about the course. In the first case (materials for the classes), all presentations the teacher used in their classes were published as well as all the papers the pre-service teachers read.

In the first year classes, slides of presentations and papers about “History Science, Current Trends in Chemistry Teaching, Chemistry Teacher Training and History Chemistry in the Chemistry Teaching” were published. In the second year classes, we expanded the use and, besides the issues mentioned above, materials about “Conceptual Maps, Cooperative Learning, Strategy Case Study and Scientific Argumentation” were made available. Scientific papers about these topics were also published in the Blog. Figure 3 illustrates the posts of slides of presentations for the themes: Conceptual Maps and Cooperative Learning.



Figure 3: Publication slides of presentations for the themes: Conceptual Maps and Cooperative Learning.

The information about the course was divided into three sub-pages: (1) Course, (2) Activities, and (3) Teacher Professional Internship. In the first, Course, we published the course structure and the assessment criteria for both years. In the second, Activities, the assignments together with deadlines for their publication were posted, as well as a regularly updated table containing the assignments already accomplished by the students. In the third sub-pages, Teacher Professional Internship, additional information on the teacher’s professional internship was given. The information made available was the duration of the internship in the secondary school, the activities pre-service teachers needed to carry out in the school and tables with details of dates and times that each pre-service teacher should perform while observing chemistry classes and engaging in the practicum component internship.

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BLOG: AS A PEDAGOGICAL STRATEGY

As a pedagogical strategy, the blog was used by the pre-service teachers to post their academic activities and critical reflections about the Teacher Professional Internship and to exchange information with other trainee teachers. To do so, we created the “Extracurricular Activity” and “Collective Diary” sub-pages. The first activity on the “Extracurricular activity” was the familiarization by the pre-service teachers with the blog. They made a brief

introduction of themselves, including their expectations regarding the course and the use of the blog. We used the Content Analysis Methodology (Moraes, 1999) to analyze their post, about the use of the blog, following these steps: Preparation of the Information; Segmentation of the content into content units; Classification of the units into categories; Description and Interpretation.

The postings in the blog were divided into 3 categories:

- *Easiness to develop and understand activities*: "It is very interesting to use the blog as one of the tools of the subject, this will make our tasks easier" and "I liked the idea of using the blog, because it will be more practical and will help us to develop our activities".
- *Information sharing*: "I believe that the blog will make the information sharing of our experiences and the sharing of teaching materials easier", "I hope the blog is an interface to improve group communication, contributing to a better performance of everybody during the course" and "I hope the blog will be a space that allows us to share views and experiences, so that we can improve our teaching practice together".
- *Use in professional activities*: "Regarding the blogs I think it is a very interesting alternative. I believe that every tool added to our training is welcome. Not only for the subject but also as a tool that can be used when we begin teaching", "The use of the blog is very interesting due to the interaction between teacher and students", and "It's a good experience and can be used in our future teacher practicum component".

The second extracurricular activity for the pre-service teachers was a questionnaire on the access and use of computers and the Internet by them. A link to a form created in Google Docs® (Drive) was inserted into the blog for online completion. The following Thematic Studies were assigned to the pre-service teachers, as the third extracurricular activity: 1) Alternative Conceptions, 2) Scientific Work, 3) Chemistry Teaching, and 4) Scientific Argumentation in the classroom. All activities carried out during these two years involved the reading of texts and actions developed on the blog to share experiences among pre-service teachers.

For the first and the second Thematic Studies, the pre-service teachers prepared and published a summary on the subject on the blog. Then, a discussion in class was set to expand the understanding of the theme. For the third and fourth Thematic Studies each trainee teacher was responsible for reading one paper about a theme and asking two questions about it and

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posting them in the blog. Each pre-service teacher was requested to answer the questions of one colleague. The discussion was conducted by course teacher with the aim of sharing and expanding the understanding of information among the participants. Figure 4 presents the statement of the activity for the theme Scientific Argumentation.

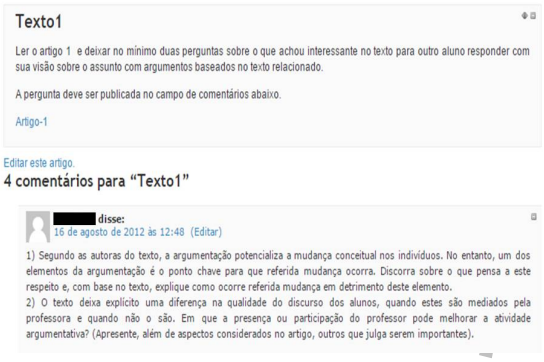


Figure 4: Thematic Studies Activity Statement for the theme Scientific Argumentation and two questions drawn up by a pre-service teacher.

The blog was also used as a pedagogical strategy by constructing of the Collective Diary together. Therein, the pre-service teachers posted their observation about three activities of the Teacher Professional Internship. As for Observing Chemistry classes at the high school level in Brazilian secondary schools, trainee teachers published their impressions, observations, and reflections for all the classes they observed. At Preparing experimental activities and didactic materials supporting the high school Chemistry teacher in their classes, pre-service teachers published the activities developed in the school and informed the activities that were developed jointly.

And Offering and implementing a Chemistry course in the science museum, which was performed as a group, the pre-service teachers posted the theme of course, materials and schedule of activities. An area in the blog was designed so that interactions between members of the same group and with others could take place. All posts were commented by the teacher or mentor teacher of the course to provide feedback and suggestions for how the pre-service teachers could approach their learning tasks.

BLOG: IMPRESSIONS OF PRE-SERVICE TEACHERS

In the following, we will show the pre-service teachers' impressions regarding the use of

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blog in the course in an exploratory way. At the end of the course, the trainee teachers posted their considerations about the benefits, difficulties, and good points of using the blog. We used the Content Analysis Methodology (Moraes, 1999) to analyze the post.

The postings in the blog were divided into 9 categories: two for the difficulties and seven for its benefits encounter in the use of blog. The two categories for the difficulties mentioned were Posting files and Tool ignorance. Similar results were reported in Wang and Hsua (2008) who analyzed the factors affecting the pre-service teachers´ motivation to use the blog, identifying that some participants were not familiar with the blogging procedure, and needed to spend time learning how to use a blogging system. Regarding the first category, the difficulties mentioned were posting files, especially images. Two pre-service teachers mentioned this aspect, although one clarified that "after the mentor teacher explained how to post images and videos, it was easy to work with the blog". Tool ignorance was another issue since it was a new tool for the students. “It was slightly difficult at first to work with the blog, but over the time, it has been overcome” suggesting that “had more activities been carried out during class, the use of the blog would have become easier and more frequent”.

As for the benefits of the use of blogs the pre-service teachers considered that this tool favored interactive/collaboration among them, their colleagues, and the teacher/mentor of the course. The interaction occurred more quickly, compared with face-to-face classrooms, providing a fast feedback to the teachers and also could collaborate with the students to become more active outside the classroom (Wang & Hsua, 2008; O’Connor, 2011; Killeavy & Moloney, 2010; Mansor, 2011). Such aspects contribute to the process of teaching and learning since the teachers encourage the contact of students with it outside of the classroom, which can lead to greater motivation among students and also because students can expand spaces for cooperative learning (Yuksel, 2009; Wang & Hsua, 2008).

PSTs also highlighted that the fact that the course materials are available on the blog facilitated the development of activities related to the discipline and made it possible to disseminate information. These aspects contribute to the learning process (Yuksel, 2009) and they considered the use of this tool in their future professional activities. This aspect takes us to assume that working with the blog for the future teachers from their pre-service education familiarizes them with the blog and motivates to use this technological tool in the teaching context (Killeavy & Moloney, 2010).

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The participants highlighted the importance and benefits of the blog:

- Organization of data: “the organization and data storage in the blog is very good, because all the contents are in the same place, are clearly presented and organized”.
- Speed of interaction: “the blog increased the speed of student-student and student-teacher interaction”.
- Information sharing: “The blog is a more flexible way to share knowledge, experiences and opinions. Each post can be commented, there is a feedback, and the opportunity to reassess the post content”, “With the blog, it was possible to see my colleagues’ opinions and to have access to the work they produced” and “The use of the blog was especially important to exchange information and opinions about the readings required by the teacher, to report on the progress of Teacher Professional Internship and the observation stage, and to post the strengths and weaknesses observed during the Teacher Professional Internship”.
- Facilitating the discussion between subjects: “Another important point is the discussion environment that the blog is able to create; if you look at the teacher practicum component report, we will find that new posts incorporated aspects from the oldest" and “Using the blog helped us work as a team (e.g. in the activity we needed to develop a common text together), share information and opinions on readings required by teacher”.
- Giving a fast feedback from the teacher: “Through the blog, we get a faster feedback on our activities from the teacher and mentor teacher”,
- Use in professional activities: “The blog proved to be a very interesting tool to aid training during the course”, and “proving to be feasible when used in future teaching practice”, “The blog is a communication channel and it encourages the use of technology in education. This approach benefits the student with the computer” and “The use of a blog is very simple because users do not need to know programming language to create their own blog. So it is possible for teachers of any subject to create and handle a blog, which will help them to prepare differentiated lessons for presenting the course content”
- Easiness to develop and understand activities: “I liked to use the blog, because in many activities I learned the concepts more easily”

CONCLUSIONS

The use of a blog expanded the communication between the participants involved in the course, thus, supporting the process of learning and instruction, since it allowed reflections of pre-service teachers on Chemistry learning.

Furthermore, the blog encouraged expression of opinions among participants and enabled permanence of discussions, i.e. the textual discussions could later be redeemed by teacher and

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trainee teacher. The pre-service teachers had the opportunity to produce content, encouraging authorship, interactivity and socialization of information.

We found that before the use of the blog students thought that its use could be important for three different areas, Easiness to develop and understand activities, which would be carried out in the Teaching Practice in Chemistry Discipline; Information sharing with the other pre-service teachers and with the subject teacher and mentor teacher; and for the Use in professional activities, the pre-service teachers explored the blog's potential and experienced the benefits of learning with this tool, what motivated them to think about the blog in its use in their future teacher practicum component.

After the use of the blog, pre-service teachers mentioned these same three categories, and added six more categories: two for the difficulties faced when using the blog and four for its benefits. Regarding the difficulties found in the use of the blog, pre-service teachers mentioned Posting files and Tool Ignorance. It is important to note that the same trainee teachers mentioned that these were easily solved after a better contact with the tool.

As for the benefits, they mentioned: a) Organization of data: the information regarding the subject was available in the blog, which made the access to the knowledge of pre-service teachers at any moment easier; b) Speed of interaction: being an online tool the information was available more quickly, making it easier for pre-service teachers to c) Give a fast feedback and d) Facilitate the discussion between subjects. These actions helped the pre-service teachers to see the blog as an area for collective conversations seeking to facilitate the teaching-learning process.

These results show that the pre-service teachers' impressions regarding the use of the blog were positive, suggesting its adoption in the course as potentially favorable, especially for exchanging experiences about the Teacher Professional Internship, and for their future teacher practicum component. Moreover, the activities the pre-service teachers posted about in the blog contributed significantly to building knowledge on teaching chemistry themes and increasing the likelihood of its use in the participants' future teaching practice. So consider that this contact for the future professors with the blog, still in their initial training, allowed them to learn, feel and reflect the use of Information and Communication Technology in their educational practices.

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Ubiquitous Öğrenme Uygulamalarına İlişkin Ulusal Eğilimler: Sistematik Alan Taraması

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Özet
İlerleyen teknoloji ile birlikte bireysel ihtiyaçlar da değişmekte ve yeni istekler ortaya çıkmaktadır. Bu ihtiyaç ve istekler eğitim alanında da paralel bir hızla ilerlemekte, bireylere daha iyi ve dinamik öğrenme imkânları sağlamayı amaçlayan alternatifler geliştirilmektedir. İnsan ve bilgisayar etkileşimini temel alan ubiquitous learning modelinde de kişinin zaman ve yer kısıtlaması olmaksızın, istediği bilgiye ulaşabilmesi amaçlanmıştır. Ülkemizde, özellikle son yıllarda, bu alanda çeşitli çalışmalar yapılmaktadır. Bu çalışmada da son iki yıl içerisinde indeksli dergilerde yer alan ulusal çalışmalar incelenmiştir.

Anahtar Sözcükler: Ubiquitous, ubiquitous learning, ubiquitous computing, uzaktan eğitim, web tabanlı eğitim, e-öğrenme.

Giriş

Bilgi Çağı'nın getirilerinden biri olan teknoloji tabanlı öğrenme, gelişen teknoloji ve artan nüfus ile doğru orantılı olarak yeni alternatifler üretmektedir. Bu alternatifler, internetin girdiği hemen her ortama girebilmekte ve aranan bilgilere kolaylıkla ulaşma imkânı sağlamaktadır.

Ortam ve zamandan bağımsız bu alternatifler, günümüzde Türkiye'de ve birçok gelişmiş ülkede yalnızca okullar kapsamında kullanılmanın da dışına çıkarak özel sektör ve birçok kamu kuruluşlarında da kullanımı yaygınlaşmaktadır. Kurum içi eğitim ihtiyaçları ve benzeri kitle eğitim gereklilikleri ile birlikte meydana gelen yeni kullanım alanları, gün geçtikçe artmakta ve farklı olanakların geliştirilmesi için yön belirlemektedir.

Ubiquitous Learning Nedir?

Ubiqutious Learning, bireylerin ihtiyaçlarına yönelik elde edilen bilgilerin, kişilerin bilişsel becerileri, ön bilgileri ve öğrenme stillerine göre bir ortam sağlamayı amaçlayan, yer ve zamandan bağımsız bir öğrenme modelidir. Sakamura ve Koshizuka (2005), u-öğrenmeyi, günlük yaşantımızda küçük bilgisayarlarla birlikte cebimize kadar ulaşan, bilgi ve iletişim teknolojileri trendi olarak tanımlamaktadır.

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Ubiquitous öğrenme 1980'lerin sonunda ortaya atılan "Ubiquitous Computing" kavramına dayanmaktadır (Zhang, 2008). Bu alanda yapılan çalışmalar, teknolojinin gidişatıyla yön bulmuştur.

U-öğrenme kapsamına giren alanlardan biri olan uzaktan eğitimde de yer ve zamandan bağımsız bir eğitim ortamı ön plandadır. Uzaktan eğitim, öğrenciyle eğitsel kaynaklar arasında bağlantı kurarak eğitimi gerçekleştiren bir sistemdir. (Gülnar, 2008)

"Bir başka tanımda da uzaktan eğitimin aşağıdaki bileşenleri kapsadığını belirtmektedir (Heinich, Molenda, Russel ve Smaldino, 1996:284):

- *Öğrenenlerle öğretmenin fiziksel olarak ayrı olması*
- *Organize edilmiş bir öğretim programı*
- *Teknolojik araç*
- *İki yönlü iletişim"* (Gülnar, 2008)

Günümüzde Türkiye'de ve birçok gelişmiş ülkede yalnızca okullar kapsamında kullanılmanın da dışına çıkarak özel sektör ve birçok kamu kuruluşlarında da kullanımı yaygınlaşmaktadır. Geleneksel öğretimi kullanan birçok kuruluş, yavaş yavaş internet tabanlı öğrenmeye doğru yönelmektedir. Kurum içi eğitim ihtiyaçları ve benzeri kitle eğitim gereklilikleri ile birlikte meydana gelen yeni kullanım alanları, gün geçtikçe artmakta ve farklı olanakların geliştirilmesi için yön belirlemektedir. Gün geçtikçe uzaktan eğitime artan bu ilgi sonucunda da web tabanlı öğretim sistemler sürekli bir şekilde yenilenerek geliştirilmektedir. Kurumlar, okullar hedefledikleri eğitimlere göre özel sistemler oluşturabilmekte ya da var olan uygun bir sistemi kendilerine göre uyarlayabilmektedirler. Çokça tercih edilen video konferanslar, etkileşimli veri paylaşımı gibi imkânlar sağlayan web tabanlı öğretim sistemleri üzerinde, kullanıcılara daha çok verim ve kullanışlılık sağlamak üzere arayüz geliştirme, hız arttırma ve fonksiyonelleştirme gibi çeşitli detaylandırmalar yapmak için çalışmalar sürdürülmektedir.

BULGULAR

Ubiquitous öğrenme alanında yapılan çalışmaların odaklandığı konuların dağılımı Tablo 1'de verilmiştir.

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Tablo 1. Araştırma konularının dağılımı

Araştırma Konusu	**Sayı**
Uzaktan Eğitim	**6**
Çevrimiçi Öğrenme	**6**
• Web ortamında öğrenme	2
• E-öğrenme	3
Öğrenme – Öğretme Modelleri	**1**
• Probleme dayalı öğrenme	1
Teknoloji	**1**
• Bilgi ve iletişim teknolojileri entegrasyonu	1
Çoklu ortam özellikleri	**3**
• Ekran tasarımı	1
• Teknik kapasite	1
• Kullanılabilirlik	1
Öğrenen Özellikleri	**1**
• Duyduğunu anlayabilme	1
İletişim	**1**
• Kurumsal iletişim	1
Hizmetiçi Eğitim	**1**
• Organizasyonel eğitim	1
Değerlendirme	**5**
• Öğrenci performans değerlendirme	3
• Öğretim yazılımı değerlendirme	2
Çevrimiçi Sınavlar	**1**
TOPLAM	26

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Yukarıdaki tabloya baktığımızda, daha çok performans değerlendirme ve çevrimiçi öğrenme ortamlarının değerlendirilmesi konuları üzerinde odaklanma olduğu görülmektedir.

İncelenen çalışmalarda odaklanan yaş grupları ve araştırma yöntemleri Tablo 2'de verilmiştir.

Tablo 2. Yaş grubu ve araştırma yöntemleri

Yaş Grupları	**Sayı**
• Yetişkin	1
• Üniversite	6
• Ortaokul	1
• İlkokul	3
Yöntemler	
• Alan taraması	6
• Betimsel tarama	1
• Yarı - deneysel	3
• Deneysel	4
• Karma	2

İncelenen araştırmalarda, daha çok üniversite öğrencileri ile çalışıldığı görülmüştür. Bu durum, ülkemizde web tabanlı eğitimlerin üniversitelerde daha yaygın kullanılması sebebine dayandırılabilir.

İncelenen araştırmalar doğrultusunda, öğrenme stilleri, öğrenme problemleri, bilişsel beceriler ve sayabileceğimiz daha birçok öğrenme özellikleri de web tabanlı öğrenme sistemleri oluşturulurken göz önünde bulundurulduğunda, verim ve kalıcılığın arttığı gözlemlenmektedir. İşitsel ve görsel öğelerin öğretim sürecindeki etkileri, olumlu ya da olumsuz olarak, öğrenen özellikleri ve öğrenme stillerine göre farklılıklar göstermektedir. Bireylerin bilişsel süreçlerini hızlandırmak amaçlı yapılacak çalışmalarda, özellikle bu unsurlar göz önünde bulundurulmalıdır. Kullanılan u-öğrenme materyali kimine göre hızlı ya da kısa gelirken diğer bireye göre yavaş ya da çok uzun süreli gelebilir (Özen, 2013). Bunun yanında, ortaokul ve ilkokul öğrencileri için öğretim sürecinin tamamında kullanılmasından ziyade sürece destek olarak uyarlanmasının daha verimli olduğu gözlemlenmiştir. Akpınar ve Karadeniz'in (2015) yapmış oldukları bir çalışmada da, web tabanlı öğretimin ilköğretim 6. sınıf öğrencilerinin akademik başarılarına etkisini ölçmek hedeflenmiş ve sonucunda kayda değer oranda olumlu bir farklılık elde edilmiştir. Dolayısıyla yaş faktörü, hedeflenen öğrenmeye ulaşmak ve kullanılacak sistemlerin etkinliği bakımından oldukça önem taşımaktadır.

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Öğrenme ve öğretmede yeterli düzeyde verim sağlanabilmesi için var olan problemlerin çözümlenmesine yönelik çalışmalar yapılmalıdır. Bu konudaki yurtiçi ve yurtdışındaki örneklere bakıldığında, u-öğrenme sistemlerinin öğrencilerin ilgi ve motivasyonlarını arttırarak öğrenme problemlerinin çözülmesinde büyük oranda yardımcı olduğu görülmektedir. Tekdere ve Mahiroğlu'nun (2014) üniversite öğrencilerinin web tabanlı ve probleme dayalı öğrenmeye yönelik tutumlarına etkisi üzerine yapmış olduğu bir çalışmada da, olumlu farklılıklar gözlemlenmiştir.

ARAŞTIRMANIN AMACI

Araştırmanın genel amacı, ubiquitous öğrenme uygulamalarına ilişkin sistematik alan taraması yapılarak ulusal eğilimlerin durumunun değerlendirilmesidir.

YÖNTEM

Çalışmanın yöntemi doküman incelemesidir. Elektronik ortamda alan yazın taraması yapılarak veriler elde edilmiştir. Ulakbim (www.ulakbim.gov.tr) veri tabanı kullanılarak, indeksli dergilerde son iki yıl içerisinde yayımlanan çalışmalar taranmıştır. Bu kapsamda yaş grubu, alan, yöntem ve sonuç veri türleri analiz edilmiştir.

SONUÇ

Son iki yıl için yapılan incelemelere göre kullanıcılara cezbedici imkânlar sunan web tabanlı öğretim sistemlerine olan ilgi hızla artarken, Türkiye'de u-öğrenme alanında henüz birçok konuda az sayıda çalışma yapıldığı gözlemlenmektedir. Alandaki bu boşluğu doldurmak üzere, öğrenme problemleri hedef alınarak çeşitli uygulamalar geliştirilebilir ve kullanımı sağlanabilir. Bununla birlikte, öğrenme stratejileri, öğrenen özellikleri ve farklılıkları, öğrenme stilleri gibi konular üzerinde ileriye yönelik olarak yapılacak çalışmalar da alana katkıda bulunacaktır (Akkaya, 2013).

Teknolojideki ilerlemelerle birlikte gelişen bilgi toplumunun gereksinimlerinin de artması, alanda daha yeni ve verimli çalışmalar yapılmasına teşvik etmektedir. Günlük hayatta da sıkça kullanılan mobil teknolojiler üzerinde yapılacak geliştirmelerin öğrenme süreçleri üzerinde olumlu etkiler meydana getireceği düşünülmektedir (Çakır, 2011). Uygulama geliştirirken aynı zamanda, öğrenme ve öğretmenin internete taşındığı günümüzde, sanal ortamlarda kullanılan içeriklerin ve yöntemlerin kalitesinin nasıl iyileştirilebileceği yönünde yanıtlar aramayı sürdürmemiz gerekmektedir (Gülbahar, Alper, 2014). Ayrıca, uzaktan eğitimin en

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çok eleştirilen yönlerinden biri olan yüzyüze etkileşim kısıtlılığını en aza indirgemek için öğrenciler ve öğretmen veya yönlendirici kişi arasındaki iletişimin mümkün mertebe yüzyüze etkileşim sağlanabilecek bir biçimde tasarlanmasının fayda sağlayacağı düşünülmektedir (Tekdere, Mahiroğlu, 2014).

ÖNERİLER

Genel olarak Türkiye'deki eğitim teknolojileri alanında yapılan çalışmalara bakıldığında;

- Her yöntemde olduğu gibi uzaktan eğitim sistemlerinin de olumsuz özellikleri vardır ve amaç bunları en aza indirerek verimi arttırmak olmalıdır.
- Teknoloji alanındaki yenilikler takip edilerek daha çok kullanıcı odaklı sistemler geliştirilmesi teşvik edilmelidir.
- Yapılacak çalışmalarda daha çok uygulamaya yönelik hedefler belirlenmesi bu alanda etkili yeniliklere yol açabileceği gibi birçok uzaktan öğretim probleminin çözülmesinde de yardımcı fikirler ortaya çıkaracaktır.

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Ülkemizde Öğrenme Yaklaşimlari İle İlgili Yapilan Çalişmalardaki Genel Eğilim

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Özet
Bireyler; düşünme stili, öğrenme biçimi, öz yeterlilik inancı, denetim/kontrol odağı, epistemolojik inanç ve kişilik yapısı gibi çok çeşitli bireysel farklılıklara sahiptir ve bu farklılıklar öğrenmeleri üzerinde etkilidir. Bireylerin öğrenmesi üzerinde etkili olan faktörlerden biri de, öğrenme yaklaşımlarıdır. Öğrenme yaklaşımları; belirli bir öğrenme işini gerçekleştirmek için gözetilen amaç ve seçilebilecek etkinliklerdeki farklılaşmayı ifade etmekte olup, öğrencilerin ders çalışırken kullandıkları stratejileri ve bu stratejileri seçme amaçlarını kapsamaktadır. Bu araştırma kapsamında ise; ülkemizde, öğrenme yaklaşımları ile ilgili yapılan ve bu araştırma kapsamında ulaşılabilen çalışmalardaki genel eğilimin belirlenmesi amaçlanmıştır. Ülkemizde öğrenme yaklaşımları ile ilgili olarak yapılan çalışmalar incelendiğinde, bireylerin öğrenme yaklaşımlarının belirlenebilmesine olanak sağlayacak araçların geliştirilmesi veya Türkçe'ye uyarlanması ile beraber, yapılan çalışmalarda da artış olduğu gözlenmektedir. Ayrıca, öğrencilerin öğrenme yaklaşımlarının; cinsiyet, yaş, sınıf düzeyi, anabilim dalı/bölüm, mezun olunan lise türü ve barınma olanağı vb. gibi değişkenlere göre anlamlı bir farklılık gösterip göstermediğinin incelendiği ve öğrenme yaklaşımları ile akademik başarı, öğrenme yaklaşımları ile biliş üstü algı, öğrenme yaklaşımları ile denetim odağı, öğrenme yaklaşımları ile akademik öz-yeterlilik algısı, öğrenme yaklaşımları ile düşünme stilleri arasındaki ilişkinin araştırıldığı ve öğrencilerin öğrenme yaklaşımlarının yordayıcısı olarak epistemolojik inançları ile ilgili çalışıldığı görülmektedir. Ancak, yapılan çalışmalarda, daha çok, öğretmen adaylarının öğrenme yaklaşımları üzerinde durulduğu ve tarama türü araştırmalar yapıldığı görülmektedir. İleride yapılacak araştırmalarda, deneysel nitelikteki araştırmalara ağırlık verilmesi ve nicel verilerin yanı sıra nitel verilerden de yararlanılması öğrenme yaklaşımları ile ilgili daha derin bilgiler edinilmesini sağlayacağından önemli görülmektedir.

GİRİŞ

Bilgi ve iletişim teknolojilerinde yaşanan gelişmeler üretilen bilgi miktarının da her geçen gün katlanarak artmasına olanak sağlamaktadır. Bireylerin bu hızlı gelişime ayak uydurabilmeleri için, ihtiyaç duydukları bilgileri ihtiyaç duydukları zaman öğrenebilmeleri önem arz etmektedir. Bu bağlamda bireylerin öğrenme ihtiyaçlarını karşılamak için, bireysel farklılıklarının da dikkate alındığı öğrenme ortamları tasarlanmalıdır. Çünkü bireyler; düşünme stili, öğrenme biçimi, öz yeterlilik inancı, denetim/kontrol odağı, epistemolojik inanç ve kişilik yapısı gibi çok çeşitli bireysel farklılıklara sahiptir ve bu farklılıklar öğrenmeleri üzerinde etkilidir. Bireylerin öğrenmesi üzerinde etkili olan faktörlerden biri de, öğrenme yaklaşımlarıdır.

Öğrenme yaklaşımı kavramı Marton ve Saljö (1976a, 1976b) tarafından yapılan

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çalışmalarla ortaya konulmuş olup, bireylerin öğrenme işine nasıl çaba harcadıkları ve belli bir okuma parçasını nasıl algıladıkları ile ilgili yapılan çalışmalarla açıklanmıştır (Akt: Önder ve Beşoluk, 2010). Bu çalışmalarda öğrencilerin verilen bir metin üzerinde nasıl çalıştıklarına dair nitel araştırmalar yapılmıştır. Çalışma grubundaki öğrencilerin bir kısmı, okudukları metni, sorulması beklenen sorulara yanıt verebilmek için ezberlenmesi gereken ayrı bilgi ünitelerinin toplamı olarak görürken, diğer bir kısmı ise, metni bir bütün olarak görerek, yazarın görüşünü yakalamaya ve metnin altında yatan anlamı kavramaya çalışmışlardır. Birinci durumdaki öğrencilerin gösterdiği öğrenme yaklaşımı "yüzeysel yaklaşım", ikinci durumdaki öğrencilerin gösterdiği öğrenme yaklaşımı ise "derin yaklaşım" olarak adlandırılmıştır (Akt: Önder ve Beşoluk, 2010; Yılmaz ve Orhan, 2011). Yılmaz ve Orhan (2011) ise, Entwistle ve McCune (2004) ile Prosser ve Trigwell (1999) tarafından yapılan çalışmalardan yararlanarak, öğrenme yaklaşımlarının; belirli bir öğrenme işini gerçekleştirmek için gözetilen amaç ve seçilebilecek etkinliklerdeki farklılaşmayı ifade etmekte olduğunu ve öğrencilerin ders çalışırken kullandıkları stratejileri ve bu stratejileri seçme amaçlarını kapsadığını belirtmiştir. Alanyazın tarandığında öğrencilerin öğrenme yaklaşımlarının belirlenmesinin; öğrencileri daha iyi öğrenenler haline getirmede yardımcı olma (Dart ve Clarke, 1991), kendi öğretiminin etkinliğini izlemek ve geliştirmek isteyen akademisyenlere yardımcı olma (Svensson, 1977), etkisiz stratejilerden dolayı risk altındaki öğrencileri belirleme (Shreemathi, 2001) ile öğrenme deneyimi ve çıktılarını gözlemleme (Newble ve Entwistle, 1986) açısından önemli olduğu belirtilmiştir (Akt: Abraham, Vinod, Kamath, Asha ve Ramnarayan, 2008). Buradan hareketle, bireylerin çağın gereklerini yerine getirebilmelerinde ve yenilikleri takip edip ayak uydurabilmelerinde, öğrenme yaklaşımlarının önemli bir değişken olduğu söylenebilir. Bu nedenle, bu çalışma kapsamında ülkemizde öğrenme yaklaşımları ile ilgili yapılan çalışmalardaki genel eğilimin belirlenmesi amaçlanmış ve ileride yapılabilecek araştırmalar ile ilgili önerilere yer verilmiştir.

İLGİLİ ARAŞTIRMALAR

Alanyazın tarandığında öğrenme yaklaşımları ile ilgili yurtdışında çok fazla çalışma (Cano, 2005; Case ve Marshall, 2004; Chin ve Brown, 2000; Gibbs ve Coffey, 2004; Gijbels ve Dochy, 2006; Kember, Biggs ve Leung, 2004; Trigwell, Prosser ve Waterhouse, 1999; Wilson ve Fowler, 2005) yapılmasına karşın, ülkemizde bu konuda yeteri kadar çalışma yapılmadığı göze çarpmaktadır. Ancak; nitel yöntemlerin dışında da, öğrencilerin öğrenme yaklaşımlarının belirlenebilmesine olanak sağlayan veri toplama araçlarının geliştirilmesi ile birlikte ülkemizde yapılan çalışmalarda da bir artış olduğu söylenebilir. Bu bağlamda, ülkemizde

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yapılan çalışmalarda, farklı araştırmacılar tarafından, değişik düzeylerdeki öğrencilerin öğrenme yaklaşımlarının belirlenebilmesine olanak sağlayan çeşitli veri toplama araçlarının geliştirildiği veya Türkçe'ye uyarlandığı görülmektedir (Batı, Tetik ve Gürpınar, 2010; Çolak ve Fer, 2007; Ekinci, 2008; Ellez ve Sezgin, 2002; İlhan, Çetin ve Kılıç, 2013; Önder ve Beşoluk, 2010; Senemoğlu, 2011; Uygun Aydıner, 2012; Yılmaz ve Orhan, 2011).

Yapılan çalışmalar incelendiğinde, daha çok yükseköğretim seviyesindeki öğrencilerin öğrenme yaklaşımlarının belirlenebilmesine yönelik, farklı veri toplama araçları geliştirildiği (Ekinci, 2008; Ellez ve Sezgin, 2002) veya Türkçe'ye uyarlandığı görülmektedir (Batı ve diğerleri, 2010; Önder ve Beşoluk, 2010; Senemoğlu, 2011; Yılmaz ve Orhan, 2011). Alanyazın tarandığında Biggs, Kember ve Leung (2001) tarafından geliştirilen ve öğrencilerin öğrenme yaklaşımlarının derin veya yüzeysel olarak sınıflandırılmasına olanak sağlayan ölçeğin sıklıkla kullanıldığı görülmektedir. Biggs ve diğerleri (2001) tarafından geliştirilen bu ölçek, farklı araştırmacılar tarafından, değişik isimler altında Türkçe'ye de uyarlanmıştır. Orijinal ölçek; Batı ve diğerleri (2010) tarafından öğrenme yaklaşımları ölçeği olarak, Önder ve Beşoluk (2010) tarafından çalışma süreci anketi olarak ve Yılmaz ve Orhan (2011) tarafından ise, ders çalışma yaklaşımı ölçeği olarak isimlendirilerek Türkçe'ye uyarlanmıştır. Yapılan çalışmalarda, yoğun olarak yükseköğretim düzeyindeki öğrencilerin öğrenme yaklaşımlarının belirlenebilmesine yönelik araçlar geliştirilmiş ise de, Çolak ve Fer (2007) tarafından yapılan çalışmada, Kember ve diğerleri (2004) tarafından ortaöğretim öğrencilerine yönelik geliştirilmiş olan öğrenme yaklaşımları envanteri Türkçe'ye uyarlanmıştır. Çalışkan, Yurt ve Aydın (2013) tarafından yapılan çalışmada da, Çolak ve Fer (2007) tarafından Türkçe'ye uyarlanan öğrenme yaklaşımları envanterinin doğrulayıcı faktör analizinin yapılması ve güvenirliğinin belirlenmesi amaçlanmıştır. Elde edilen bulgular, öğrenme yaklaşımları envanterinin ortaöğretim öğrencilerinin öğrenme yaklaşımlarının belirlenmesinde kullanılabileceğini göstermiştir. Ayrıca Uygun Aydıner (2012) tarafından yapılan çalışmada, Biggs ve diğerleri (2001) tarafından geliştirilen ölçekten yararlanılarak, üniversite düzeyindeki müzik eğitimi öğrencilerinin piyano dersi için öğrenme yaklaşımlarını belirlemek üzere kullanılabilecek bir ölçek geliştirilmiştir. Benzer şekilde İlhan, Çetin ve Kılıç (2013) tarafından yapılan çalışmada da 430 lise öğrencisi ile çalışılmış ve öğrencilerin matematik öğrenme yaklaşımlarını geçerli ve güvenilir olarak ölçmeye olanak tanıyacak bir ölçme aracının geliştirilmesi amaçlanmıştır.

Öğrencilerin ders çalışma sürecinde derin veya yüzeysel yaklaşımlardan hangisini

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kullandıklarının belirlenmesi, etkili öğretim ortamlarının oluşturulmasına katkıda bulunacağından ve yüzeysel öğrenme yaklaşımına sahip öğrencilerin, derin öğrenenler olmalarına yönelik adımların atılmasına imkân sağlayacağından önemli görülmektedir. Bu bağlamda, ülkemizde yapılan ve bu araştırma kapsamında ulaşılabilen çalışmalar ile ilgili bilgiler Tablo 1'de sunulmuştur.

Tablo 1. Öğrenme Yaklaşımları ile İlgili Ülkemizde Yapılan Çalışmalar

Alıntı	Amaç	Örneklem Düzeyi	Örneklem Sayısı	Öğrenme Yaklaşımı Nasıl Belirlenmiş?
Ellez ve Sezgin (2002)	Ortaöğretim fen ve matematik alanlar eğitimi öğretmen adaylarının öğrenme yaklaşımlarını belirlemek, öğrencilerin öğrenme yaklaşımlarının; cinsiyet, sınıf düzeyi ve anabilim dalına göre anlamlı bir farklılık gösterip göstermediğini incelemek ve öğrencilerin öğrenme yaklaşımlarının akademik başarı ile ilişkisini ortaya koymak amaçlanmıştır.	Lisans (Eğitim Fakültesi)	251	Yazarlar tarafından geliştirilen 30 maddelik beşli Likert tipteki öğrenme yaklaşımları ölçeği kullanılmıştır.
Sezgin Selçuk, Çalışkan ve Erol (2007)	Fizik öğretmen adaylarının öğrenme yaklaşımlarını belirlemek ve öğrencilerin öğrenme yaklaşımlarının cinsiyet, sınıf düzeyi ve akademik başarı ile ilişkisini ortaya koymak amaçlanmıştır.	Lisans (Eğitim Fakültesi)	141	Ellez ve Sezgin (2002) tarafından geliştirilen öğrenme yaklaşımları ölçeği kullanılmıştır.
Karadeniz Bayrak ve Erkoç (2008)	Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümü öğrencilerinin; biliş üstü algı düzeylerinin sınıf düzeylerine göre farkını belirlemek, öğrenme yaklaşımlarının sınıf düzeylerine göre farkını belirlemek ve biliş üstü algılarıyla öğrenme yaklaşımları arasındaki ilişkiyi ortaya koymak amaçlanmıştır.	Lisans (Eğitim Fakültesi)	95	Ellez ve Sezgin (2002) tarafından geliştirilen öğrenme yaklaşımları ölçeği kullanılmıştır.
Ekinci (2009)	Üniversitelerin lisans programlarına devam eden öğrencilerin öğrenme yaklaşımlarını tercih etme düzeylerini belirlemek ve bazı öğretme-öğrenme süreci değişkenleri (üniversite, konu alanı, sınıf düzeyi, öğretme-öğrenme ortamı algısı, akademik başarı düzeyi) ile ilişkisini ortaya koymak amaçlanmıştır.	Lisans (Diğer)	3428	Ekinci (2008) tarafından geliştirilen öğrenme yaklaşımları ölçeği kullanılmıştır.
Ekinci (2015)	Eğitim fakültesinde öğrenim gören öğretmen adaylarının öğrenme yaklaşımlarını (derinlemesine, yüzeysel ve stratejik) tercih etme düzeyleri ile öğretmen özyeterlik inançlarının düzeyi arasındaki ilişkilerin belirlenmesi amaçlanmıştır.	Lisans (Eğitim Fakültesi)	285	Ekinci (2008) tarafından geliştirilen öğrenme yaklaşımları ölçeği kullanılmıştır.
Ekinci ve Ekinci (2011)	Üç farklı eğitim fakültesindeki ilköğretim programlarına devam eden öğrencilerin farklı öğrenme yaklaşımlarını (derinlemesine, stratejik, yüzeysel) tercih etme düzeylerini ve bazı değişkenlerle (üniversite, konu alanı, akademik başarı, sınıf düzeyi ve mezun	Lisans (Eğitim Fakültesi)	772	Ekinci (2008) tarafından geliştirilen öğrenme yaklaşımları ölçeği kullanılmıştır

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Alıntı	Amaç	Örneklem Düzeyi	Örneklem Sayısı	Öğrenme Yaklaşımı Nasıl Belirlenmiş?
	olunan lise türü) ilişkilerinin belirlenmesi amaçlanmıştır.			
Senemoğlu (2011)	Türk ve Amerikan eğitim fakültesi öğrencilerinin öğrenme yaklaşımları ve çalışma becerileri belirlenmeye çalışılmıştır. Ayrıca, öğrencilerin tercih ettikleri öğrenme yaklaşımlarının alanlarına, sınıf düzeylerine ve cinsiyetlerine göre farklılık gösterip göstermediğinin belirlenmesi amaçlanmıştır.	Lisans (Eğitim Fakültesi)	206 Amerikan ve 806 Türk öğrenci	Türk öğrencilerin öğrenme yaklaşımlarını belirlemek üzere Tait, Entwistle ve McCune (1998) tarafından geliştirilen öğrenme yaklaşımları ve çalışma becerileri ölçeği yazar tarafından Türkçe'ye uyarlanmış, Amerikalı öğrenciler için ise ölçeğin orijinali kullanılmıştır.
Ozan, Köse ve Gündoğdu (2012)	Okul öncesi ve sınıf öğretmenliği öğrencilerinin öğrenme yaklaşımlarını tercih etme düzeylerini ve tercih düzeylerinin bölüm, cinsiyet ve sınıf düzeyi değişkenleri açısından anlamlı bir farklılık gösterip göstermediğini belirlemek amaçlanmıştır.	Lisans (Eğitim Fakültesi)	330	Senemoğlu (2011) tarafından Türkçe'ye uyarlanan öğrenme yaklaşımları ve çalışma becerileri ölçeği kullanılmıştır.
Ozan ve Çiftçi (2013)	Eğitim fakültesi öğrencilerinin öğrenme yaklaşımlarını tercih etme düzeylerinin ve tercih düzeylerinin; bölüm, cinsiyet ve sınıf düzeyi değişkenleri açısından anlamlı bir farklılık gösterip göstermediğinin incelenmesi amaçlanmıştır.	Lisans (Eğitim Fakültesi)	393	Senemoğlu (2011) tarafından Türkçe'ye uyarlanan öğrenme yaklaşımları ve çalışma becerileri ölçeği kullanılmıştır.
Şahin Taşkın (2012)	Sınıf öğretmeni adaylarının öğrenme yaklaşımlarının yordayıcısı olarak epistemolojik inançlarını incelemek amaçlanmıştır.	Lisans (Eğitim Fakültesi)	214	Önder ve Beşoluk (2010) tarafından Türkçe'ye uyarlanan düzenlenmiş iki faktörlü çalışma süreci anketi kullanılmıştır.
Özgür ve Tosun (2012)	Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğretmen adaylarının, öğrenme yaklaşımlarını ve bu yaklaşımların cinsiyet, yaş, mezun olunan lise türü ve sınıf düzeyi değişkenleri ile olan ilişkisini belirlemek amaçlanmıştır.	Lisans (Eğitim Fakültesi)	103	Önder ve Beşoluk (2010) tarafından Türkçe'ye uyarlanan düzenlenmiş iki faktörlü çalışma süreci anketi kullanılmıştır.
Ayanoğlu, Ciğer, Abuhanoğlu ve Aydın (2014)	Lisans ve ön lisans eğitim düzeylerinde işletme alanında eğitim gören öğrencilerin sosyo-kültürel özellikleri ile öğrenme yaklaşımları arasında fark olup olmadığının araştırılması amaçlanmıştır.	Ön lisans ve Lisans	591	Önder ve Beşoluk (2010) tarafından Türkçe'ye uyarlanan düzenlenmiş iki faktörlü çalışma

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Alıntı	Amaç	Örneklem Düzeyi	Örneklem Sayısı	Öğrenme Yaklaşımı Nasıl Belirlenmiş?
				süreci anketi kullanılmıştır.
Geçer (2012)	Öğretmen adaylarının ders çalışma yaklaşımları ile bilgi okuryazarlık öz-yeterlik düzeylerini belirlemek ve bunlar arasında anlamlı bir ilişki olup olmadığını saptamak amaçlanmıştır.	Lisans (Eğitim Fakültesi)	703	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Çuhadar, Gündüz ve Tanyeri (2013)	Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin ders çalışma yaklaşımlarını incelemek ve ders çalışma yaklaşımının akademik öz-yeterlik ile ilişkisini ortaya koymak amaçlanmıştır.	Lisans (Eğitim Fakültesi)	147	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Batdal Karaduman (2013)	Öğrencilerin problem temelli öğrenmeye yönelik tutumları ve çalışma eğilimleri arasındaki ilişkinin araştırılması amaçlanmıştır.	Lisans (Eğitim Fakültesi)	100	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Batdal Karaduman, Güder, Özsoy Güneş ve Kırbaşlar (2014)	Bilinç düzeylerinin ve öz-düzenleyici öğrenme yeteneklerinin öğretmen adaylarının çalışma sürecine etkisini incelemek amaçlanmıştır.	Lisans (Eğitim Fakültesi)	272	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Olpak ve Korucu (2014a)	Ön lisans programlarındaki öğrencilerin ders çalışma yaklaşımlarının belirlenmesi ve farklı değişkenler (cinsiyet, yaş, sınıf, bölüm ve akademik genel not ortalaması) ile olan ilişkisinin incelenmesi amaçlanmıştır.	Ön lisans	256	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Olpak ve Korucu (2014b)	Öğretmen adaylarının öğrenme yaklaşımları ile denetim odakları arasındaki ilişkinin incelenmesi amaçlanmıştır.	Lisans (Eğitim Fakültesi)	245	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Korucu ve Olpak (2014)	Ön lisans programlarındaki öğrencilerin öğrenme yaklaşımlarının belirlenmesi ve düşünme stilleri ile olan ilişkisinin incelenmesi amaçlanmıştır.	Ön lisans	234	Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.
Taşdemir, Çalışkan ve	Eğitim fakültesi son sınıf öğretmen adaylarının öğrenme yaklaşımlarının ne	Lisans (Eğitim	267	Yılmaz ve Orhan (2011) tarafından

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Alıntı	Amaç	Örneklem Düzeyi	Örneklem Sayısı	Öğrenme Yaklaşımı Nasıl Belirlenmiş?
Kula (2014)	düzeyde olduğunun ve cinsiyet, okudukları bölüm ve barınma olanakları değişkenleri açısından farklılaşma durumlarının belirlenmesi amaçlanmıştır.	Fakültesi)		Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeği kullanılmıştır.

Tablo 1'de de görülebileceği gibi; yapılan çalışmalarda, öğrencilerin öğrenme yaklaşımlarının; cinsiyet, yaş, sınıf düzeyi, anabilim dalı/bölüm, mezun olunan lise türü ve barınma olanağı vb. gibi değişkenlere göre anlamlı bir farklılık gösterip göstermediği incelenmiştir. Ek olarak; öğrenme yaklaşımları ile akademik başarı, öğrenme yaklaşımları ile biliş üstü algı, öğrenme yaklaşımları ile denetim odağı, öğrenme yaklaşımları ile akademik öz-yeterlilik algısı, öğrenme yaklaşımları ile düşünme stilleri arasındaki ilişki araştırılmış ve öğrencilerin öğrenme yaklaşımlarının yordayıcısı olarak epistemolojik inançları ile ilgili çalışılmıştır. Ayrıca ülkemizde yapılan çalışmalarda, daha çok, öğretmen adaylarının öğrenme yaklaşımları üzerinde durulmuştur (Batdal Karaduman, 2013; Batdal Karaduman ve diğerleri, 2014; Çuhadar ve diğerleri, 2013; Ekinci, 2015; Ekinci ve Ekinci, 2011; Ellez ve Sezgin, 2002; Geçer, 2012; Karadeniz Bayrak ve Erkoç, 2008; Olpak ve Korucu, 2014b; Ozan ve diğerleri, 2012; Ozan ve Çiftçi, 2013; Özgür ve Tosun, 2012; Senemoğlu, 2011; Sezgin Selçuk ve diğerleri, 2007; Şahin Taşkın, 2012; Taşdemir ve diğerleri, 2014). Öğrencilerin öğrenme yaklaşımlarının belirlenmesinde ise, Yılmaz ve Orhan (2011) tarafından Türkçe'ye uyarlanan ders çalışma yaklaşımı ölçeğinin sıklıkla tercih edildiği görülmektedir. Çalışmalardaki örneklem sayılarının ise genel olarak yeterli olduğu söylenebilir.

SONUÇ ve ÖNERİLER

Sonuç olarak; ülkemizde öğrenme yaklaşımları ile ilgili olarak yapılan çalışmalar incelendiğinde, bireylerin öğrenme yaklaşımlarının belirlenebilmesine olanak sağlayacak araçların geliştirilmesi veya Türkçe'ye uyarlanması ile beraber, yapılan çalışmalarda da artış olduğu gözlenmektedir. Ayrıca, öğrencilerin öğrenme yaklaşımlarının; cinsiyet, yaş, sınıf düzeyi, anabilim dalı/bölüm, mezun olunan lise türü ve barınma olanağı vb. gibi değişkenlere göre anlamlı bir farklılık gösterip göstermediğinin incelendiği ve öğrenme yaklaşımları ile akademik başarı, öğrenme yaklaşımları ile biliş üstü algı, öğrenme yaklaşımları ile denetim odağı, öğrenme yaklaşımları ile akademik öz-yeterlilik algısı, öğrenme yaklaşımları ile düşünme stilleri arasındaki ilişkinin araştırıldığı ve öğrencilerin öğrenme yaklaşımlarının yordayıcısı olarak epistemolojik inançları ile ilgili çalışıldığı görülmektedir. Ancak, yapılan çalışmalarda, daha çok, öğretmen adaylarının öğrenme yaklaşımları üzerinde durulduğu ve

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tarama türü araştırmalar yapıldığı görülmektedir.

Betimsel çalışmalar için örneklem büyüklüğü ve çeşitliliği önem arz ettiğinden, bundan sonra yapılacak çalışmalarda, ülkemizde 15 milyondan fazla öğrencinin üniversite öncesi eğitim basamaklarında olduğunu da göz önünde bulundurarak, farklı eğitim düzeylerindeki öğrencilerin, çeşitli bireysel farklılıklarının da dikkate alındığı çalışmaların yapılması, öğrenme yaklaşımları ile ilgili daha fazla değişken hakkında bilgi sahibi olunmasını sağlayacağından önemli görülmektedir. Ayrıca, ileride yapılacak araştırmalarda, deneysel nitelikteki araştırmalara ağırlık verilmesi ve nicel verilerin yanı sıra nitel verilerden de yararlanılması, öğrenme yaklaşımları ile ilgili daha derin bilgiler edinilmesini sağlayacağından önemli görülmektedir.

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Yetişkinlere Yönelik Kişisel Gelişim Eğitimlerinin Çevrimiçi Ortamda Verilmesi: İETT Örneği

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Özet

Bilgi çağında ve teknolojinin hızla ilerlediği günümüzde her sektörden farklı kurum ve kuruluşlar bilgi birikimine ve gelişimine önem vermektedir. Aynı zamanda kurumlar, teknolojinin sunduğu imkânlardan maksimum fayda sağlamayı amaçlamakta ve bu amaca hizmet edecek uygulamalar geliştirmektedirler. Teknolojideki bu gelişmeler, eğitim alanında da etkili bir şekilde kullanılmaya başlamış, büyük ya da küçük çaplı kurum ve kuruluşları eğitim ve öğretim alanında yenilikçi uygulamalar geliştirmeye yöneltmiştir. Bu kurumlardan biri olan ve 13 farklı ortamda personel çalıştıran İstanbul Elektrik, Tramvay ve Tünel İşletmeleri Genel Müdürlüğü personel eğitimi ve gelişimine yeni bir yaklaşım getirerek İETT Akademi kapsamında E-Öğrenme faaliyetlerini başlatmıştır. İETT'de 2014 Mayıs ayından itibaren personele kalite eğitimleri ile kişisel ve kurumsal gelişim eğitimleri verilmeye başlanmıştır. Bu eğitimlerden İletişim Sanatı eğitimi Mayıs ayında atanmış, 2014 Ekim ayında sona ermiştir. Kurumda ilk defa e-öğrenme modeli ile eğitim verilmiş olmasına karşın, 914 personele atanan bu eğitime 717 kişi başlamış, bunlardan 644 eğitimi tamamlamıştır. Eğitim sürecinin sonunda uygulanan eğitim sonu değerlendirme anketi sonuçları ve memnuniyet oranları bu çalışma kapsamında ele alınacaktır. Ayrıca bu çalışmada yapılan gözlemler ışığında Kamu Kurum ve Kuruluşlarında e-öğrenme modelinin yararları ve sınırlılıklarına ilişkin ipuçları verilmeye çalışılmıştır.

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Anahtar Kelimeler: E-öğrenme, Eğitim Teknolojileri, IETT Akademi

In online environment to give personal development education for adults: Example of IETT

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Abstract

In knowledge and developing technology age, different organizations and foundations which are from all fields give importance information saving and development. In the same time organizations aim to get maximum advantage from opportunities which technology presents and develop applications that will serve for this aim. These improvements in technology started to be used in education field effectively, so that massive or mini size organizations and foundations turned to improve innovative

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applications in education and teaching field. Istanbul Electric, Tram and Tunnel Organizations General Directorate (IETT) that is one of these organizations and employs staff in 13 different locations began e-learning applications by getting a new approach for staff training and development in the scope of IETT Academy Project. Quality management training with personal and organizational development programs have been started to be given to staffs in IETT since May 2014. Art of Communication course is one of these programs assigned in May 2014 and finished in October 2014. Although it was the first time given course with e-learning model, 914 personnel were assigned this course and 717 personnel started and 644 of them completed this course. Results of end of training evaluation survey which applied at the end of assigned training and satisfaction rates will be evaluated in the scope of this study. Besides in the light of observations which were done in this study, cues that related advantages and restrictions of e-learning model in the public organizations and foundations are attempted to be given.

Keywords: E-learning, Educational Technology, IETT Academy

1. E-Öğrenme

Henry e-öğrenmeyi organizasyonda yer alan öğrenme ve bilgi birikiminin yönetilmesi ve iletilmesini destekleyen uygun internet uygulamaları ve teknolojileri olarak (Henry, 2001), Fry ise internet ile birlikte diğer bilgi toplama ve iletişim teknolojilerinin eğitim ve öğrenimin iletilmesinde kullanılması (Fry, 2001) olarak tanımlamaktadırlar. Her iki tanımda eğitim içeriklerinin internet teknolojileri üzerinden iletildiğini ifade etmektedir.

E-Öğrenme, Amerikan Eğitim ve Gelişim Topluluğu tarafından ise; web tabanlı öğrenme, bilgisayar tabanlı öğrenme, sanal sınıflar, dijital işbirliği, internet/intranet yoluyla içerik paylaşımı, telekonferanslar, uydu yayını gibi uygulamaları kapsayan süreç olarak tanımlanmıştır(Renee, Fritzsche, & Eduardo , 2005). Bu süreç, çalışanlarının sürekli olarak öğrenmesini ve kendisini geliştirmesine imkan sağlayan ticari ve diğer kuruluşlar tarafından talep görmektedir.

E-öğrenme internet kullanımını gerektiren bir öğrenme biçimidir. Çoklu formatlarda içerik iletimini, öğrenme deneyiminin yönetimini, öğrencilerden oluşan ağı, içerik geliştiricileri ve uzmanları gerektirmektedir. E-öğrenme, daha düşük maliyette daha hızlı öğrenme ve öğrenme sürecinde katılımcılar için belirli sorumluluklar sunmaktadır (Gunasekaran, McNeil, & Shaul, 2002).

E-öğrenme kavramı asenkron (kişilerin bilgisayar başında kendi kendilerine eğitim almaları) ve senkron (eş zamanlı olarak bir grup öğrenci ve öğretmeninin, canlı olarak bilgisayar ortamında, bir sınıfta buluşmaları) olarak iki sınıf şeklinde kategorize edilmiştir (Akt. Duran, Önal, & Kurtuluş). Asenkron eğitim eş zamanlı olma zorunluluğu olmadığı için daha geneldir ve iyi tasarlanmış bir eğitim içeriği ile öğrenme aktivitesi etkili bir şekilde gerçekleştirilir. Senkron eğitim veya etkinleştirilmiş asenkron eğitim (iletişim araçlarıyla

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zenginleştirilmiş) ile yapılan karma eğitim ile çok daha başarılı sonuçlar elde edildiği ifade edilmektedir (Duran, Önal, & Kurtuluş). Bir e-öğrenme ortamı tasarlanırken en az 3 durum dikkate alınmalıdır (Okamato, 2000): Bunlar öğrenme hedefleri olarak bilgi ve yeteneği ifade eden pedagojik amaçlar, öğretilecek olan konunun içeriği ve öğrenme ortamı olarak tanımlanan öğrenme biçimleridir.

E-öğrenme ortamında gerçek bir başarı elde edebilmek için gereklilikler (Kayama & Okamoto, 2008) tarafından ise şu şekilde belirtilmiştir:

1.Belirlenmiş öğrenme amaçlarını etkileyen iyi incelenmiş eğitim programına dayanan içeriklerin kalitesi.

2. Eğitsel ve teknolojik açılardan hizmetlerin kalitesi

3. Danışmanların katılımı ve sorumluluğu

4. Teknolojik değişimleri kopyalamak

5. Kesintisiz bilgi akışı ve kolay bağlantı

6. Yeniden kullanılabilir kaynaklar için bilgi deposu

7. Yazım ve iletimin birleştirilmesi

8. Uygulamalar ve araçlar için eklentiler gibi fonksiyonların paylaşımı

1.1 E-öğrenmenin avantajları

E-öğrenmenin başlıca avantajı "herhangi bir yerde ve zamanda" gerçekleşmesi özelliğidir. Zaman ve mekândan bağımsız olmasının yanı sıra dağınık biçimde kurulan organizasyonlarda ulaşım ve konaklama maliyetlerini dikkate değer derecede düşürmektedir (Kayama & Okamoto, 2008). E-öğrenmenin avantajları (Harun, 2002) tarafından ise şu şekilde sıralanmıştır; ihtiyaç anında öğrenme, yeterince öğrenme, seyahat giderlerini ortadan kaldırma, daha düşük maliyete öğretim içeriğinin dağıtılması, her zaman güncel olması, bireylerin ortamına özel e-öğrenme sağlanması.

21.yy'da bireyler ve organizasyonlar olarak hayatta kalabilmemiz öğrenme kapasitemize ve öğrendiklerimizi hayata geçirmemize bağlıdır. Öğrenme ihtiyaçları günümüzde dinamik olarak hızlı bir şekilde değişmektedir (Kayama & Okamoto, 2008). E-öğrenme, zaman, uzaklık ve sosyo-ekonomik statü bakımından bireyler arasındaki farklılığı ortadan kaldırıp yaşam boyu öğrenmeye yardımcı olduğu gibi (Gunasekaran, McNeil, & Shaul, 2002) bilgiyi hızlı bir şekilde elde etmek ve kişilerin kendi hızlarında çalışabilmelerine olanak tanıdığı için 21.yy. bireyleri için uygun olduğu düşünülmektedir (Harun, 2002).

1.2. E-öğrenmenin dezavantajları

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Gerçekleştirilen e-öğrenme uygulamalarının avantajlarının yanı sıra bazı dezavantajları da bulunmaktadır. Dezavantajları arasında kurulum maliyeti, kolayca kafa karıştıran güvenilmez bilgisayar sistemleri, reklam içerikli öğrenme programları (Harun, 2002) şeklinde belirtilmiştir. Aslan ise e-öğrenmenin bazı dezavantajlarını şu şekilde listelemektedir; bilgisayar dosyalarının yönetimi ve çevirim içi öğrenme yazılımının kullanımı bilgisayar okur-yazarlığı düşük olan öğrenenler için karmaşık gelebilir, e-öğrenme daha fazla sorumluluk ve disiplin gerektirir, e-öğrenenler neyi ve nasıl çalışacağına karar verme yeteneğine sahip olmalıdır (Aslan, 2006). Bununla paralel olarak ise dezavantajları şöyle ifade etmektedir; e-öğrenmenin geliştirmesi maliyetli olabilir, içerik üreticiler için yeni becerileri gerektirebilir, ilgili teknoloji kafa karıştırıcı ya da şaşırtıcı olabilir, yüz yüze sınıf ortamındaki iletişim ve sosyal ilişki yoktur, gelişmiş görsellerin yoğun olarak kullanıldığı içeriklerin maliyeti yüksek olabilir, e-öğrenme ortamındaki öğrencilerin beli bir programı takip edecek sorumluluğa ve disipline sahip olmaları gerekir(Cantoni, Cellario, & Porta, 2004).

Yapılan bir çalışmada (SARAÇ & ÇİFTÇİOĞLU, 2010) tarafından aktarılan tabloda e-öğrenme uygulamalarının çalışanlar ve organizasyonlar için yaratığı avantaj ve dezavantajlar kısaca özetlenmektedir.

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Ekonomik Boyut	
Güçlü Yönler	**Zayıf Yönler**
Eğitim uygulama maliyetleri düşük	İlk yatırım maliyetleri yüksek
Seyahat/eğitmen/sınıf masrafları yok	Destek ve bakım maliyetleri gerekiyor
Sosyal Boyut	
Güçlü Yönler	**Zayıf Yönler**
Coğrafik sınırlar yok	İnteraktiflik azalır
Hata yapmaktan çekinilmez	Eğitmen otoritesi azalır, kötüye kullanılabilir
Pedagojik Boyut	
Güçlü Yönler	**Zayıf Yönler**
Hatırlama yeteneği klasik metotlara göre %25 artıyor	Tüm becerilerin kazandırılmasında tek başına yeterli değil
Eğitim içeriğinin sunulmasında fazla seçenek	Eğitimin tasarlanması zaman alıcı
Rol Sorumluluk ve Yetkinlikler	
Güçlü Yönler	**Zayıf Yönler**
Esnek ve yetkin eğitmen	Rol karmaşası yaratabilir
Kendi eğitim sorumluluğunu alabilen yetkin çalışan	Yetkin çalışan ve eğitmen bulmanın veya yetiştirmenin zorluğu
Teknolojik Boyut	
Güçlü Yönler	**Zayıf Yönler**
Teknoloji sayesinde standart eğitimin çok fazla kişiye en hızlı ve en çabuk ve en ucuz şekilde ulaşması	Teknofobi Teknolojik altyapı gerekliliği
Müşteri Boyutu	
Güçlü Yönler	**Zayıf Yönler**
Öğrenme için gerekli zaman %40 - %60 azalıyor	Her kişilik için uygun olmayabilir
Tam zamanında istenen miktarda eğitim	
Kontrol çalışanın elinde	
Herkesin öğrenme stiline ve yetkinliğine adapte olabilir	

Tablo 7 (Akt. SARAÇ & ÇİFTÇİOĞLU, 2010)

2. İETT'de E-Öğrenme

"Sürekli Öğrenir, Yenilik Yaparız" İstanbul Elektrik, Tramvay ve Tünel İşletmeleri(İETT) Genel Müdürlüğünün sahip olduğu mükemmellik politikasının temel öğelerinden biridir. Bu politika ile yenilikçilik anlayışı ile sektörel ve mesleki gelişimlerin takip edilmesi, iyi uygulamaların öğrenilmesi ve bu uygulamaların en yüksek düzeyde faydayı sağlamak üzere kuruma kazandırılması hedeflenmiştir. Aynı zamanda çalışanların motivasyon, memnuniyet ve bilgi birikimlerini arttırmak İETT İnsan Kaynakları ve Eğitim Daire Başkanlığının temel hedeflerinden biridir. Bu doğrultuda personel eğitimi ve gelişimine yeni bir yaklaşım getirilerek İETT Akademi kapsamında E-Öğrenme faaliyetleri başlatılmıştır. E-öğrenme modeli ile personele kalite eğitimleri ile kişisel ve kurumsal gelişim eğitimleri verilmeye başlanmıştır. Bu çalışma kapsamında kişisel gelişim eğitimlerinden olan İletişim Sanatı eğitiminin sonuçları değerlendirilerek yorumlanacaktır.

İletişim Sanatı eğitimi e-öğrenme modeli ile tüm memurlara atanan ilk eğitim olmuş, bu eğitim 13 Mayıs- 27 Ekim 2014 tarihleri arasında çalışanların kullanımına açılmıştır. Bu süreçte eğitim toplam 914 kişiye atanmıştır. İletişim sanatı eğitiminin genel tamamlama

durumu tablo-2'de gösterilmiştir.

Genel Tamamlama Durumu	Kişi Sayısı
Başlamayan	197
Yarıda bırakan	73
Bitiren	644
Toplam	**914**

Tablo 8: Eğitim Tamamlama Durumu

Tüm memurlara e-öğrenme modeli ile ilk defa eğitim atanmış olmasına rağmen eğitim tamamlama oranının %70 olması, e-öğrenme modelinin İETT'de kullanılabileceğinin göstergesidir.

Eğitim Değerlendirme Anketi

Eğitim değerlendirme anketi olarak hizmet sağlayıcı firmanın uzmanları tarafından geliştirilen eğitim değerlendirme anketi kullanılmıştır. Eğitimi bitiren 644 kullanıcıya, eğitim tamamlandıktan hemen sonra eğitim değerlendirme anketi uygulanmış ve kullanıcılar anketi doldurmadan diğer sayfalara geçememişlerdir. Anket soruları 610 kullanıcı tarafından cevaplanmıştır. Ancak bazı sorular kullanıcılar tarafından cevaplanmadığı için bu soruların cevaplanma oranları değişiklik göstermektedir. 34 kişi ise anket üzerinde hiçbir işaretleme yapmadan anket formunu göndermiştir. Eğitim değerlendirme anketinde on altısı 5'li likert tipi, biri açık uçlu soru olmak üzere toplam 17 soru bulunmaktadır. Bu çalışma kapsamında 5'li likert tipinde olan 8 soru kapsama dâhil edilmiştir.

Maddeler	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Tamamen Katılıyorum
Madde 1	% 2 - [12 Kişi]	% 4 - [22 Kişi]	% 14 - [88 Kişi]	% 38 - [231 Kişi]	% 42 - [257 Kişi]
Madde 2	% 3 - [17 Kişi]	% 5 - [28 Kişi]	% 17 - [101 Kişi]	% 38 - [233 Kişi]	% 38 - [232 Kişi]
Madde 3	% 3 - [16 Kişi]	% 4 - [25 Kişi]	% 11 - [70 Kişi]	% 40 - [241 Kişi]	% 42 - [258 Kişi]

Tablo 9: Eğitim Değerlendirme Anket Sonuçları

Madde 1: Eğitimde yeni şeyler öğrendiğimi ve farklı bilgiler kazandığımı düşünüyorum.
Tablo 3'te de gösterildiği gibi eğitimi tamamlayanların %80'i eğitimde yeni ve farklı bilgiler öğrendiği konusunda olumlu dönüt vermiştir. Bu orandan anlaşıldığı gibi eğitimi tamamlayann büyük çoğunluğu yeni bilgiler öğrendiğini belirtmiştir.

Madde 2: Eğitim içeriği yaptığım iş ile ilgiliydi ve ilgimi çeken bir konuydu.
Tablo 3'te gösterildiği gibi kullanıcıların 465'i eğitimi işi ile ilgili ve ilgi çekici bulduğu konusunda olumlu dönüt vermiştir.

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Madde 3: Bu eğitimde kazandıklarımı iş hayatımda kullanabileceğime inanıyorum.

Tablo 3'e bakıldığında eğitimi tamamlayanların 499'u eğitim sonrası kazandıklarını iş hayatında kullanabileceğini

düşünmektedir. Bu düşünceye sahip olanlar eğitimi tamamlayan personelin %82'sini oluşturmaktadır.

Maddeler	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Tamamen Katılıyorum
Madde 4	% 5 - [28 Kişi]	% 5 - [30 Kişi]	% 12 - [75 Kişi]	% 39 - [238 Kişi]	% 39 - [237 Kişi]
Madde 5	% 2 - [15 Kişi]	% 3 - [17 Kişi]	% 9 - [57 Kişi]	% 38 - [231 Kişi]	% 48 - [290 Kişi]
Madde 6	% 2 - [15 Kişi]	% 1 - [9 Kişi]	% 12 - [73 Kişi]	% 42 - [257 Kişi]	% 42 - [256 Kişi]
Madde 7	% 2 - [12 Kişi]	% 2 - [13 Kişi]	% 9 - [53 Kişi]	% 42 - [256 Kişi]	% 45 - [275 Kişi]
Madde 8	% 5 - [29 Kişi]	% 3 - [19 Kişi]	% 10 - [61 Kişi]	% 35 - [210 Kişi]	% 47 - [288 Kişi]

Tablo 10: Eğitim Değerlendirme Anket Sonuçları

Madde 4: Eğitim içeriği motivasyonumu arttıracak şekilde tasarlanmıştı ve sıkılmadan takip edebildim.
Tablo 4'e bakıldığında eğitimi tamamlayanların 475'i eğitim içeriğinin motivasyonu arttırıcı olarak tasarlanmış olduğunu ve eğitim süresince sıkılmadıklarını belirtmişlerdir.

Madde 5: Eğitim görsel açıdan tatmin ediciydi. (Resim, fotoğraf, grafik, animasyon, illüstrasyon, video, renk ve yazı kullanımı açısından)
Tablo 4'te görüldüğü gibi eğitim içeriği 521 kullanıcı tarafından görsel açıdan tatmin edici bulunmuştur. Eğitimi tamamlayanların %86'sının olumlu şekilde dönüt verdiği görülmektedir.

Madde 6: İçerikte kullanılan etkileşimler öğrenmemi kolaylaştırdı. (Etkileşimler: Sorular, alıştırmalar, vaka örnekleri ve diğer uygulamalar)
Tablo 4'te görüldüğü gibi eğitimi tamamlayanların 513'ü öğrenme içeriğinin etkileşimli olmasının öğrenmeyi kolaylaştırdığını düşünmektedir. Bu düşünceye sahip olanların oranı eğitimi tamamlayan personelin %84'ünü oluşturmaktadır.

Madde 7: İçerikte kullanılan görsel öğeler öğrenmemi destekledi. (Görsel Öğeler: animasyon, resim, fotoğraf, grafik, illüstrasyon, video vb.)
Tablo 4'te görüldüğü gibi öğrenme içeriğinin öğrenmeyi desteklediği 531 kullanıcı tarafından belirtilmiştir. Yani eğitimi tamamlayanların %87'si içerikte kullanılan görsellerin öğrenmeyi desteklediği yönünde olumlu dönüt vermiştir.

Madde 8: Kullandığım İnternet tarayıcısı ile eğitimi izlerken sıkıntı yaşamadım. (Internet Tarayıcısı: Internet Explorer, Mozilla Firefox gibi.)

Tablo 4'e bakıldığında eğitimi tamamlayan kullanıcılardan 498'inin tarayıcı kaynaklı bir sıkıntı yaşamadığı görülmektedir.

Sonuç ve Tartışma

E-öğrenme uygulamaları sahip olduğu özellikler yönüyle organizasyonlara çeşitli fırsatlar

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sunmaktadır. Bu fırsatların anlaşılarak, öğrenenlere ihtiyaç duyduğu içeriğin sunulması, doğru entegrasyon stratejileri kullanılması, klasik eğitimlerin e-öğrenme uygulamaları ile desteklenmesi sonrasında uzun vadede eğitim maliyetlerinin azalması, eğitimler için zaman ve mekan bağımsızlığı, çalışan memnuniyetindeki artış gibi pek çok olumlu geri dönüş sağlayabilir. İETT'de yapılan e-öğrenme uygulamaları sonucunda da çalışanlar e-öğrenme ile yeni bilgiler kazandığını ve bu bilgileri iş hayatında kullanabileceğini, içeriklerin öğrenmelerinde ve motivasyonlarında olumlu etkisi olduğunu belirtmişlerdir.

İETT'de e-eğitimlerin alınmasını teşvik etmek üzere eğitimden alınan puanlar performans puanını etkilemektedir. Performans puanları 6 aylık dönemlerde yılda 2 defa hesaplanmakta, bu puana göre çalışanlara teşvik edici ödüller verilmektedir. Kamu, kurum ve kuruluşlarında e-öğrenme modeli ile eğitim faaliyetleri gerçekleştirilecekse bu şekilde bir teşvikin verilmesi ya da diğer ödül ve teşvik edicilerin verilmesi oldukça önemlidir.

İETT'de e-eğitimlerin uygulanması sürecinde bazı sınırlıklar ile karşılaşılmıştır. Bunlardan bazıları karmaşık bilgisayar sistemleri, bu karmaşık bilgisayar sistemlerinin bilgisayar okur-yazarlığı düşük olan çalışanlara zor gelmesi ve bazı teknik problemlerin ortaya çıkmasıdır. İETT'de yaşanan bu problemlerden karmaşık bilgisayar sistemleri (Harun, 2002) ve bilgisayar okur-yazarlığı düşük olan çalışanlar için sistemin karmaşık gelmesi (Aslan, 2006) e-öğrenme ortamlarında en çok problem yaşanan noktalardır. Bu gibi problemlerin üstesinden gelmek pek kolay olmayacağı gibi, öğrenenlere gerek telefon gerekse mail yolu ile destek verilmesi önerilmektedir. Ayrıca diğer e-öğrenme projelerinde ki gibi kamu, kurum ve kuruluşlarında da e-öğrenme projelerine yatırım yapılmadan önce, öğrenenlerin bilgisayar okur-yazarlığı seviyelerinin tespiti yapılması ve hedef kitlenin eğitimlere ulaşabilecek teknik donanım ve yeterliliklere sahip olduğundan emin olunması, projelerin başarısı açısından belirleyici olabilir.

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Bilgisayar Ve Öğretim Teknolojileri Eğitimi Bölümü Lisans Öğrencisi Ve Mezunlarının Yapay Zeka Ve Robotik Ürünleri Kullanma Eğilimlerine Ait Bir Alan Araştırması

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ÖZET
Dünyanın pek çok yerinde, yapay zekâ ve robotik ürünlere olan eğilim artmaktadır. Bugüne kadar yapay zekâ çalışmalarında eşik olarak kabul edilen Turing testi artık geçilmiştir. Bu gelişme, yapay zekâ ve robotik ürünlerin hayatımızdaki yerinin daha da artacağına işaret etmesi açısından önemlidir. Dünyada bu gelişmeler görülürken, Türkiye'de de yapay zeka ve robotik ürünler hakkında bir farkındalılık başlamıştır. Bu çalışmanın temel amacı, "Eğitimde Yapay Zekâ Uygulamaları" dersi almış Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin ve mezunlarının, yapay zekâ ve robotik ürünlere yaklaşımlarını ve mezun olduktan sonra iş hayatlarında yapay zekâ ve robotik ürünleri kullanma eğilimlerini incelemektir. Araştırmada nicel araştırma yöntemlerinden olan anket tekniği kullanılmıştır. Bu bağlamda, katılımcıların yapay zekâ ve robotik ürünler hakkında görüşleri alınmış, daha sonra bu veriler bir araya getirilerek incelenmiştir. Araştırma, Yıldız Teknik Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü lisans öğrencisi ve mezunları ile sınırlıdır. Çalışma sonunda lisans düzeyinde "Eğitimde Yapay Zekâ Uygulamaları" dersini alan öğrencilerin ve mezunların, meslek hayatlarında yapay zekâ ve robotik ürünler kullanmaya yönelik eğilimleri bireysel özelliklere uygunluk boyutu, ekonomik boyut, çevresel boyut, kolaylık boyutu, istihdam boyutu ve zorunluluk boyutu olmak üzere altı boyut altında incelenmiştir. Yapılan analizler sonucunda öğrencilerin ve mezunların konuya bakışlarının demografik özelliklerine bağlı olarak değiştiği tespit edilmiştir.

GİRİŞ
Yapay zeka; bir bilgisayarın yada bilgisayar denetimli bir makinenin, genellikle insane özgü nitelikler olduğu varsayılan akıl yürütme,anlam çıkartma,genelleme ve geçmiş deneyimlerden öğrenme gibi yüksek zihinsel süreçlere ilişkin görevleri yerine getirme yeteneği olarak tanımlanmaktadır(Nabiyev,2012).Yapay zeka tarihine bakıldığında, yaklaşık 50 yıllık bir geçmişi bulunmaktadır. Buna rağmen geleceğin teknolojisi arasında gösterilmektedir. Yapay öğrenmenin başarılı uygulamaları günlük hayatımıza girmiş durumdadır. Örneğin,konuşma ve el yazısı tanımak için geliştirilmiş ticari yazılımlar bulunmaktadır ya da Parekende satış yapan şirketler geçmiş verilerini inceleyip sonuçları müşteri ilişkileri geliştirmede kullanabilmektedir(Alpaydın).Oyle ki bir çok bilim dalının dikkatini çekerek, bu alanda yapılan çalışmalar hızla artmaktadır. Ülkemiz de, üniversite seviyesinde, öğrencilerin yapay zeka ile ilgili farkındalılığının artırılması amacı ile yeni dersler açılmaktadır. Bu derslerden bir tanesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümüne ait seçmeli derslerden biri olan "Eğitimde Yapay Zeka Uygulamaları" dersidir. Öğrenciler bu derste hem yapay zekanın temelini almakta hem de eğitimde yapay zekanın kullanım alanları hakkında bilgi sahibi olmaktadır.

Bu çalışmanın temel amacı, teknolojiyi içinde barındıran bir bölümde okumuş ve Eğitimde Yapay Zeka Uygulamaları dersi almış Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin ve mezunlarının, yapay zeka ve robotik ürünler kullanımına dair yaklaşımlarını ve mezun olduktan sonra iş hayatlarında yapay zeka ve robotik ürünleri kullanma eğilimlerini incelemektir. Bu bağlamda, katılımcıların yapay zeka ve robotik ürünler hakkında görüşleri alınmış, daha sonra bu veriler bir araya getirilerek incelenmiştir. Bu analizlerde iş hayatında yapay zeka ve robotik ürünlerin kullanılmasında Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin bakış açıları değerlendirilmeye çalışılmıştır. Analizlerde, katılımcıların demografik bilgileri incelenmiştir.

YÖNTEM
Araştırma, tarama modeli kullanılarak; Yıldız Teknik Üniversitesi'nde Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünde eğitim gören ve Eğitimde Yapay Zeka Uygulamaları dersi öğrencilerin, yapay zeka ve robotik ürün kullanımına dair sahip olduğu görüşleri araştıran betimsel bir çalışmadır.

Evren ve Örneklem
Bu araştırma çalışma grubu kapsamında, Yıldız Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümü öğrencilerini ve mezunlarını içermektedir. Bu mezun ve öğrencilerin en önemli özellikleri Eğitimde Yapay Zeka Uygulamaları dersi almış olmalarıdır.

Ancak Yıldız Teknik Üniversitesi'nde Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümü okumuş veya

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okuyan, aynı zamanda Eğitimde Yapay Zeka Uygulamaları dersi almış olan tüm öğrenci ve mezunlar çalışma grubuna dahil edilememiştir. Bunun nedeni ise; mezun öğrencilerde mezuniyet sonrası iletişimlerini koparmış mezunlara ulaşmanın verdiği zorluk iken hala öğrenci olanlarda ise sosyal medya gibi araçları aktif kullanmamak ya da hiç kullanmamaktan dolayı çevrimiçi anketin ulaştırılamamış olmasıdır.

Veri Toplama Araçları

Araştırmada veri toplamak amacıyla araştırmanın yapısına uygun olarak nicel araştırma yöntemlerinde veri toplama tekniklerinden birisi olan anket tekniği kullanılmıştır. Nicel araştırma önceden hazırlanmış bir soru formuna bağlı kalınarak, sayısal yorum ve genelleme yapılabilen araştırma türüdür. Niceliksel araştırma yönteminde, araştırılan konuya ilişkin, evreni temsil edecek örneklemden sayısal sonuçlar elde edilmektedir. Elde edilen sonuçlar üzerinde gerekli istatistikî ve matematiksel analizler yapılabilmektedir. Nicel araştırma yönteminde, araştırma evreninin araştırma konusu hakkındaki fikrinin yönü sorgulanmaktadır (Nakip, 2005).

Verilerin Analizi

Verilerin analizi için SPSS paket programı kullanılmıştır. Araştırma verileri Yıldız Teknik Üniversitesi'nde lisans düzeyinde Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünde eğitimi gören ve mezun olmuş katılımcılardan toplanmıştır. Araştırmanın amacına uygun olarak verilere faktör ve korelasyon analizinin yanı sıra verilerin normal dağılım göstermeleri nedeniyle gruplar arası farklılıkları ölçmek amacıyla T-Testi ve Anova testi uygulanmıştır.

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BULGULAR

Araştırma sonucu elde edilen verilere, frekans ve yüzde analizi uygulanmış ve katılımcıların demografik bulgularına ulaşılmıştır. Bu bulgular Tablo 1'de gösterilmiştir.

Tablo 11. Demografik veriler

		Frekans	Yüzde %
Yaş	16 - 20	10	11,4
	21 - 25	72	81,8
	26 ve üzeri	6	6,8
	Toplam	88	100
Cinsiyet	Kadın	49	55,7
	Erkek	39	44,3
	Toplam	88	100
Akademik Başarı	0 - 0,5	0	0
	0,5 - 1,0	0	0
	1,0 - 1,5	2	2,3
	1,5 - 2,0	3	3,4
	2,0 - 2,5	8	9,1
	2,5 - 3,0	30	34,1
	3,0 - 3,5	37	42
	3,5 - 4,0	7	8
	Toplam	87	98,9
Sınıf	Hazırlık	0	0
	1. Sınıf	0	0
	2. Sınıf	11	12,5
	3. Sınıf	15	17
	4. Sınıf	36	40,9
	5 ve üzeri	7	8
	Mezun	19	21,6
	Toplam	88	100
Mezun Olunan Lise Türü	Fen Lisesi	1	1,1
	Anadolu Lisesi	9	10,2
	Genel Lise	6	6,8
	Anadolu Meslek Lisesi	28	31,8
	Ticaret Meslek Lisesi	6	6,8
	Meslek Lisesi	15	17
	Anadolu Teknik Lisesi	23	26,1
	Toplam	88	100

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Tablo 1'de görüldüğü gibi araştırmaya 88 kişi katılmıştır. Katılımcıların 49 (% 55,7)'u kadın , 39 (% 44,3)'u erkektir. Katılımcıların yaş grupları analiz edildiğinde; 10 (% 11,4) katılımcı 16-20 yaş aralığında, 72 (% 81,8) katılımcı 21-25 yaş aralığında, 6 (% 6,8) katılımcının ise 26 ve üzeri yaş aralığında olduğu görülmektedir.

Bu bölümde değerlendirmeye alınan 88 anket formunda yer alan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin ve mezunlarının, aldıkları Yapay Zeka dersinden sonra öğrendiklerini meslek hayatlarında kullanma alışkanlıklarını belirlemeye yönelik düşünceleri içeren, birbiriyle ilişkili 20 ifade bulunmaktadır. Bu ifadeleri az sayıda, anlamlı ve birbirinden bağımsız faktörler haline getirmek için faktör analizi yapılmıştır.

İlk olarak verilerin faktör analizine uygunluğunu test etmek amacıyla KMO (Kaiser-Meyer-Olkin) ve Bartlett testi yapılmıştır (Büyüköztürk, 2009). Tablo 2'de faktör analizi kapsamında Bartlett testi sonucu ve Kaiser-

Meyer-Olkin (KMO) örneklem değeri gösterilmektedir.

Tablo 12. KMO and Bartlett's Testi sonuçları

KMO and Bartlett's Testi		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,749
Bartlett's Test of Sphericity	Approx. Kay-Kare	448,878
	Serbestlik Derecesi	190
	Anlamlılık	,000

Tablo 2'de faktör analizi kapsamında Bartlett testi sonucu 448,878 ve sig. değeri 0,000 düzeyi ile Kaiser-Meyer-Olkin (KMO) örneklem değeri ,749 olarak çıkmıştır. Faktör analizi için değişkenler arasında yüksek kolerasyon ilişkisi aranmaktadır. Değişkenler arasındaki korelasyon azalma gösterdikçe, faktör analizinin sonuçlarına olan güven de doğru orantılı olarak azalmaktadır. Sig.= 0,000 < 0,05 olduğundan Bartlett testi sonucu anlamlıdır. Bundan dolayı da değişkenler arasında yüksek kolerasyon mevcuttur ve veriler çoklu normal dağılımdan gelmiştir. KMO testinden elde edilen değere bakıldığında değer, 1'e yaklaştıkça mükemmel kabul edilirken 0,50'nin altına indiğinde ise mükemmel kabul edilmemektedir (Özdamar, 2004). Araştırmada KMO değeri 0,749 çıkmıştır. Dolayısıyla bu araştırma için örneklem bütünlüğü yeterlidir. Bir diğer yandan araştırma değişkenleri arasındaki ilişkileri incelemek ve çok sayıdaki değişkeni az sayıda, anlamlı ve birbirinden bağımsız faktörler haline getirmek için faktör analizi kullanılmıştır. Faktör analizi, birbiriyle ilişkili çok sayıda değişkeni bir araya getirerek az sayıda kavramsal olarak anlamlı yeni değişkenler (faktörler, boyutlar) bulmayı, keşfetmeyi amaçlayan çok değişkenli bir istatistiktir (Büyüköztürk, 2009).
Faktör analizi sonucunda ortaya çıkan bu faktörler sırası ile;
1- Bireysel özelliklere uygunluk boyutu (dersin bireysel özelliklere ve düşüncelere uygunluğu)
2- Ekonomik boyut (dersin ekonomik olarak sağladığı fırsatlar),
3- Çevresel boyutu (çevrenin derse ilişkin görüşleri)
4- Kolaylık boyutu (dersin gerektirdiği bilgi ve fiziksel donanım şartlarının az olması)
5- İstihdam boyut (dersin sağladığı istihdam fırsatları) şeklinde isimlendirilmiştir.
6- Zorunluluk boyutu (okulun sunduğu zorunluluklar) şeklinde isimlendirilmiştir.
Faktör analizi sonrasında verilerin normal dağılıp dağılmadıklarını görmek için Kolmogorov-Smirnov Testi yapılmıştır. Tablo 3'te Kolmogorov-Smirnov Testi sonuçlarını göstermektedir(Weinberg & Abramowitz, 2008).

Tablo 13. Kolmogorov-Smirnov Testi Sonuçları

Normal Dağılıma Uygunluk Testi			
	Kolmogorov-Smirnov[a]		
	İstatistik	**df**	**Sig.**
Bireysel özelliklere uygunluk boyutu	,082	36	,200*
Ekonomik boyut	,074	36	,200*
Çevresel boyutu	,064	36	,200*
Kolaylık boyutu	,103	36	,200*
İstihdam boyut	,096	36	,200*
Zorunluluk boyutu	,122	36	,195

Tablo 3'da görüldüğü gibi, faktörlerin anlamlılık (sig.) değeri 0,05'ten büyük olduğu için verilerin normal dağıldığı görülmüştür (Weinberg & Abramowitz, 2008 ;Alpar,2012).
Ankete katılım gösteren katılımcıların verileri güvenilirlik testi için incelenmiştir. Test maddelerine verilecek cevapların üç veya daha fazla olması durumunda, güvenilirlik testi için Cronbach tarafından geliştirilmiş olan alfa katsayısı kullanılır. Cronbach's Alpha değeri > 0,5 koşulu sağlandığında, anket güvenilir sayılmaktadır (Büyüköztürk, 2009). Anket verileri için bu testin sonucu Tablo 4'te görüldüğü üzere 0,698 çıktığı için, anketin güvenilir olduğu görülmektedir.

Tablo 14. Güvenilirlik Testi Sonucu

Güvenilirlik Testi	
Cronbach's Alpha	N of Items
,698	31

Demografik Faktörlere Göre Analiz

Cinsiyet
Katılımcıların cinsiyetleri ile yapay zeka konusuna yönelik düşünceleri arasında fark olup olmadığını anlamak

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için varsayımlar oluşturulmuştur. Bunlar;
H0: Cinsiyete göre yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark yoktur.
H1: Cinsiyete göre yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark vardır.
Tablo 5'te cinsiyetlerine göre katılımcıların T test grup istatistikleri yer almaktadır.

Tablo 15. Cinsiyet ile Yapay Zeka Konusuna Yönelik Düşüncelere İlişkin Independent Samples T-Testi Grup İstatistikleri

	Cinsiyetiniz nedir?	**Sayı**	**Ortalama**	**Std. Sapma**	**Ortalamanın Std. Sapması**
Bireysel özelliklere uygunluk	Kadın	23	,3513779	,86674772	,18072939
	Erkek	13	-,6216686	,94023942	,26077550
Ekonomik Faktör	Kadın	23	,0127564	,97251959	,20278435
	Erkek	13	-,0225691	1,08712771	,30151498
Çevresel Faktör	Kadın	23	-,0993953	1,09919089	,22919714
	Erkek	13	,1758532	,80570382	,22346203
Kolaylık Faktörü	Kadın	23	-,1011388	,99818267	,20813547
	Erkek	13	,1789379	1,01769253	,28225712
İstihdam Faktörü	Kadın	23	-,2096154	,92701270	,19329551
	Erkek	13	,3708580	1,05260363	,29193972
Zorunluluk Faktörü	Kadın	23	-,1272241	,96871462	,20199096
	Erkek	13	,2250888	1,05372760	,29225145

Tablo 16. Cinsiyet ile Yapay Zeka Konusuna Yönelik Düşüncelere İlişkin Independent Samples T-Testi

		Levene's Test for Equality of Variances		**t-test for Equality of Means**			
		F	**Anlamlılık Düzeyi**	**t**	**Serbestlik Derecesi**	**Sig. (2-tailed)**	**Mean Difference**
Bireysel özelliklere uygunluk	Equal variances assumed	,281	,599	3,139	34	,003	,97304653
	Equal variances not assumed			3,067	23,357	,005	,97304653
Ekonomik Faktör	Equal variances assumed	,366	,549	,100	34	,921	,03532548
	Equal variances not assumed			,097	22,770	,923	,03532548
Çevresel Faktör	Equal variances assumed	2,253	,143	-,789	34	,436	-,27524844
	Equal variances not assumed			-,860	31,508	,396	-,27524844
Kolaylık Faktörü	Equal variances assumed	,068	,795	-,803	34	,428	-,28007679
	Equal variances not			-,799	24,627	,432	-,28007679

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	assumed						
İstihdam Faktörü	Equal variances assumed	,020	,887	-1,719	34	,095	-,58047334
	Equal variances not assumed			-1,658	22,472	,111	-,58047334
Zorunluluk Faktörü	Equal variances assumed	,025	,875	-1,016	34	,317	-,35231284
	Equal variances not assumed			-,992	23,303	,332	-,35231284

Tablo 6, katılımcıların cinsiyetleri ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olup olmadığını göstermektedir. Analizde Sig. değerinin 0,01'den büyük olması ankete katılan katılımcıların cinsiyetleri ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark olmadığını gösterirken, Sig. değerinin 0,01'den küçük olması ise katılımcıların cinsiyetleri ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olduğunu göstermektedir (Weinberg & Abramowitz, 2008).

Yapılan analiz sonucunda, tablo 6'da yer alan bireysel özelliklere uygunluk ile cinsiyet arasında anlamlı farklılık olduğu görülmüştür (Sig. (2-tailed< ,01) (Weinberg & Abramowitz, 2008). Tablo 5'de yer alan bireysel uygunluk özellikleri için cinsiyet ortalamalarına bakıldığında; kadınların ortalaması (,3513779), erkeklerin ortalamasına (-,6216686) göre daha olumludur. Bu bulgu; yapay zeka ve robotik ürünler kullanımında katılımcının bireysel uygunluk özellikleri ve cinsiyeti arasında anlamlı bir ilişkinin olduğu şeklinde yorumlanabilir.

Yapılan analiz sonucunda, tablo 6'da yer alan diğer tüm faktörler (ekonomik faktör, çevresel faktör, kolaylık faktörü, istihdam faktörü ve zorunluluk faktörü) ile cinsiyet arasında anlamlı farklılık olmadığı görülmüştür (Sig. (2-tailed) < 0,1) (Weinberg & Abramowitz, 2008). Bu bulgu; yapay zeka ve robotik ürünler kullanımında katılımcının ekonomik faktör, çevresel faktör, kolaylık faktörü, istihdam faktörü ve zorunluluk faktörü ile cinsiyeti arasında anlamlı bir ilişkinin olmadığı şeklinde yorumlanabilir.

Bu durumda bireysel özelliklere uygunluk için H1 kabul edilirken, diğer faktörler için H0 kabul edilecektir.

Yaş

Katılımcıların yaşları ile yapay zeka konusuna yönelik düşünceleri arasında farlılık olup olmadığını analiz etmek için varsayımlar oluşturulmuştur. Bunlar;

H0: Öğrencilerin yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark yoktur.

H1: Öğrencilerin yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark vardır.

Tablo 7'de öğrencilerin yaşları ile ve robotik ürün kullanımına yönelik düşünceleri arasındaki ilişkiyi göstermektedir.

Tablo 17. Katılımcıların Yaşları ile Yapay Zeka ve Robotik Ürün Kullanımına Yönelik Düşüncelerine İlişkin Anova Testi

ANOVA						
		Kareler Toplamı	**Serbestlik Derecesi**	**Kareler Ortalaması**	**F**	**Anlamlılık Düzeyi**
Bireysel özelliklere uygunluk	Between Groups	3,017	2	1,509	1,557	,226
	Within Groups	31,983	33	,969		
	Total	35,000	35			
Ekonomik Faktör	Between Groups	2,139	2	1,069	1,074	,353
	Within Groups	32,861	33	,996		
	Total	35,000	35			
Çevresel Faktör	Between Groups	,315	2	,157	,150	,862
	Within Groups	34,685	33	1,051		

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	Total	35,000	35			
Kolaylık Faktörü	Between Groups	2,310	2	1,155	1,166	,324
	Within Groups	32,690	33	,991		
	Total	35,000	35			
İstihdam Faktörü	Between Groups	1,303	2	,652	,638	,535
	Within Groups	33,697	33	1,021		
	Total	35,000	35			
Zorunluluk Faktörü	Between Groups	3,107	2	1,553	1,607	,216
	Within Groups	31,893	33	,966		
	Total	35,000	35			

Tablo 7, katılımcıların yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olup olmadığını göstermektedir. Analizde Sig. değerinin 0,01'den büyük olması ankete katılan katılımcıların yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark olmadığını gösterirken, Sig. değerinin 0,01'den küçük olması ise katılımcıların yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olduğunu göstermektedir.
Analiz sonuçları incelendiğinde, katılımcıların yaşları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında anlamlı bir farklılık görülmemiştir. (Sig. < ,01)
Bu bağlamda bütün faktörler için H0 kabul edilirken H1 reddedilmiştir.

Mezun Olunan Lise

Katılımcıların mezun oldukları lise ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farlılık olup olmadığını analiz etmek için varsayımlar oluşturulmuştur. Bunlar;
H0: Öğrencilerin mezun oldukları lise ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark yoktur.
H1: Öğrencilerin mezun oldukları lise ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark vardır.
Tablo 8, katılımcıların mezun oldukları lise ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasındaki ilişkiyi göstermektedir.

Tablo 18. Katılımcıların Mezun Oldukları Lise ile Yapay Zeka ve Robotik Ürün Kullanımına Yönelik Düşüncelerine İlişkin ANOVA Testi

ANOVA						
		Kareler Toplamı	**Serbestlik Derecesi**	**Kareler Ortalaması**	**F**	**Anlamlı-lık Düzeyi**
Bireysel özelliklere uygunluk	Between Groups	9,037	5	1,807	2,089	,095
	Within Groups	25,963	30	,865		
	Total	35,000	35			
Ekonomik Faktör	Between Groups	3,005	5	,601	,563	,727
	Within Groups	31,995	30	1,067		
	Total	35,000	35			
Çevresel Faktör	Between Groups	3,135	5	,627	,590	,707
	Within Groups	31,865	30	1,062		
	Total	35,000	35			
Kolaylık	Between	3,566	5	,713	,681	,642

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Faktörü	Groups					
	Within Groups	31,434	30	1,048		
	Total	35,000	35			
İstihdam Faktörü	Between Groups	6,093	5	1,219	1,265	,305
	Within Groups	28,907	30	,964		
	Total	35,000	35			
Zorunluluk Faktörü	Between Groups	1,981	5	,396	,360	,872
	Within Groups	33,019	30	1,101		
	Total	35,000	35			

Tablo 8, katılımcıların mezun oldukları lise türü ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olup olmadığını göstermektedir. Analizde Sig. değerinin 0,01'den büyük olması ankete katılan katılımcıların mezun oldukları lise türü ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark olmadığını gösterirken, Sig. değerinin 0,01'den küçük olması ise katılımcıların mezun oldukları lise türü ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olduğunu göstermektedir.
Analiz sonuçları incelendiğinde, katılımcıların mezun oldukları lise türü ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında anlamlı bir farklılık görülmemiştir. (Sig. < ,01)
Bu bağlamda bütün faktörler için H0 kabul edilirken H1 reddedilmiştir.

Sınıf
Katılımcıların bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farlılık olup olmadığını analiz etmek için varsayımlar oluşturulmuştur. Bunlar;
H0: Öğrencilerin bulundukları sınıf veya mezun olma durumları ile ve yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark yoktur.
H1: Öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark vardır.
Tablo 9, öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasındaki ilişkiyi göstermektedir.

Tablo 19. Katılımcıların Sınıfları veya Mezun Olma Durumları ile Yapay Zeka ve Robotik Ürün Kullanımına Yönelik Düşüncelerine İlişkin ANOVA Testi

ANOVA						
		Kareler Toplamı	**Serbestlik Derecesi**	**Kareler Ortalaması**	**F**	**Anlamlılık Düzeyi**
Bireysel özelliklere uygunluk	Between Groups	2,850	3	,950	,946	,430
	Within Groups	32,150	32	1,005		
	Total	35,000	35			
Ekonomik Faktör	Between Groups	1,515	3	,505	,483	,697
	Within Groups	33,485	32	1,046		
	Total	35,000	35			
Çevresel Faktör	Between Groups	2,197	3	,732	,714	,551
	Within Groups	32,803	32	1,025		
	Total	35,000	35			
Kolaylık Faktörü	Between Groups	2,054	3	,685	,665	,580
	Within Groups	32,946	32	1,030		

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	Total	35,000	35			
İstihdam Faktörü	Between Groups	5,699	3	1,900	2,075	,123
	Within Groups	29,301	32	,916		
	Total	35,000	35			
Zorunluluk Faktörü	Between Groups	3,685	3	1,228	1,255	,306
	Within Groups	31,315	32	,979		
	Total	35,000	35			

Tablo 9 öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olup olmadığını göstermektedir. Analizde Sig. değerinin 0,01'den büyük olması ankete katılan öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark olmadığını gösterirken, Sig. değerinin 0,01'den küçük olması ise öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olduğunu göstermektedir.
Analiz sonuçları incelendiğinde, öğrencilerin bulundukları sınıf veya mezun olma durumları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında anlamlı bir farklılık görülmemiştir. (Sig. < ,01)
Bu bağlamda bütün faktörler için H0 kabul edilirken H1 reddedilmiştir.

Akademik Başarı
Katılımcıların akademik başarı puanları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farlılık olup olmadığını analiz etmek için varsayımlar oluşturulmuştur. Bunlar;
H0: Katılımcıların akademik başarı puanları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark yoktur.
H1: Katılımcıların akademik başarı puanları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark vardır.
Tablo 10, katılımcıların akademik başarı puanları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasındaki ilişkiyi göstermektedir.

Tablo 20. Katılımcıların Akademik Başarıları ile Yapay Zeka ve Robotik Ürün Kullanımına Yönelik Düşüncelerine İlişkin ANOVA Testi

ANOVA						
		Kareler Toplamı	**Serbestlik Derecesi**	**Kareler Ortalama-sı**	**F**	**Anlamlılık Düzeyi**
Bireysel özelliklere uygunluk	Between Groups	7,923	4	1,981	2,268	,084
	Within Groups	27,077	31	,873		
	Total	35,000	35			
Ekonomik Faktör	Between Groups	,587	4	,147	,132	,969
	Within Groups	34,413	31	1,110		
	Total	35,000	35			
Çevresel Faktör	Between Groups	4,049	4	1,012	1,014	,415
	Within Groups	30,951	31	,998		
	Total	35,000	35			
Kolaylık Faktörü	Between Groups	2,935	4	,734	,709	,592
	Within Groups	32,065	31	1,034		
	Total	35,000	35			

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İstihdam Faktörü	Between Groups	4,300	4	1,075	1,086	,381
	Within Groups	30,700	31	,990		
	Total	35,000	35			
Zorunluluk Faktörü	Between Groups	6,632	4	1,658	1,812	,152
	Within Groups	28,368	31	,915		
	Total	35,000	35			

Tablo 10, katılımcıların akademik başarıları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olup olmadığını göstermektedir. Analizde Sig. değerinin 0,01'den büyük olması katılımcıların akademik başarıları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında fark olmadığını gösterirken, Sig. değerinin 0,01'den küçük olması ise katılımcıların akademik başarıları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında farklılık olduğunu göstermektedir.
Analiz sonuçları incelendiğinde, katılımcıların akademik başarıları ile yapay zeka ve robotik ürün kullanımına yönelik düşünceleri arasında anlamlı bir farklılık görülmemiştir. (Sig. < ,01)
Bu bağlamda bütün faktörler için H0 kabul edilirken H1 reddedilmiştir.

SONUÇ

Geleceğin teknolojisi olarak gösterilen ve bu alanda her geçen gün araştırma sayısı çoğalan yapay zekanın farkındalılığı giderek artmaktadır. Bu araştırma kapsamında "Eğitimde yapay zeka uygulamaları" dersini alan lisans öğrencileri ve mezunlarının, yapay zeka farkındalılığı araştırılmıştır. Nicel araştırma yöntemlerinden anket veri toplama tekniği kullanılarak elde edilen veriler farklı istatistik yöntemleri kullanılarak analiz yapılmıştır. Öncelikle yapay zeka ve robotik ürün kullanımına dair düşünceler faktör analizine tabi tutulmuştur. Yapay zeka ve robotik ürün kullanımına dair düşünceleri içeren yirmi bir ifade öz değerler tablosu dikkate alınarak altı faktör altında toplanmıştır. Bu faktörler; bireysel özelliklere uygunluğu, ekonomik faktörler, kolaylık faktörü, istihdam faktörü, çevre faktörü ve zorunluluk faktörüdür. Ayrıca araştırmanın amacı çerçevesinde uygulanan farklılık analizi sonuçlarına göre, eğitimde yapay zeka dersi almış katılımcıların yapay zeka ve robotik ürün kullanımına dair düşüncelerinin; cinsiyete göre değişiklik gösterdiği görülmüştür. Katılımcıların yaşlarına, mezun oldukları lise türüne, sınıflarına ve akademik başarı puanlarına göre, yapay zeka ve robotik ürün kullanımına dair düşünceleri arasında farklılık olmadığı sonucuna ulaşılmıştır. Gelecek çalışmalarda kapsam genişletilerek yapay zekaya olan farkındalılık tespit edilebilir. Ayrıca kişilik analizi eklenerek, hangi kişilik tipine uygun kişilerin yapay zeka dersini seçtiği tespiti yapılabilir.

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Web Tabanlı Öğretimin 12. Sınıf Öğrencilerinin Matematiksel Kazanımlara Ulaşma Düzeyine Etkisinin Belirlenmesi

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Bu araştırmada 12. sınıf öğrencilerinin matematik kazanımlarına ulaşma düzeylerini belirlemede web tabanlı öğretim yönteminin etkisini belirlemek amaçlanmıştır. Araştırmada ön test – son test kontrol gruplu deney deseni kullanılmıştır. Araştırmanın evrenini 2013-2014 eğitim-öğretim yılında, İzmir ilinde yer alan bir meslek lisesinde 19 şubede öğrenim gören tüm 12. sınıf öğrencileri oluşturmaktadır. Örneklemini ise bu şubelerden basit rastgele örnekleme yöntemiyle seçilen ve iki farklı şubede öğrenim gören toplam 67 öğrenci oluşturmaktadır. Araştırma kapsamında bu iki sınıftan biri rastlantısal olacak şekilde kontrol grubu, diğeri ise deney grubu olarak belirlenmiştir. Ortaöğretim 12. sınıf Matematik dersi kapsamında yer alan "Limit" öğrenme alanı, kontrol grubunda geleneksel öğretim yöntem ve teknikleri ile gerçekleştirilirken, deney grubunda web tabanlı öğretim yöntemi kullanılarak gerçekleştirilmiştir. Verilerin toplanması aşamasında, öğrencilerin matematik dersine yönelik kazanımlara ulaşma düzeylerini belirleyebilmek için Biber (2012) tarafından geliştirilen "Matematik Kazanım Ölçeği" kullanılmıştır. Toplanan verilerin analizinde, Shapiro-Wilk normallik testi ile İlişkili Örneklemler t-testi ve İlişkisiz Örneklemler t-testinden yararlanılmıştır. Elde edilen sonuçlar, web tabanlı öğretim yönteminin 12. sınıf öğrencilerinin matematiksel kazanımlara ulaşma düzeylerini, geleneksel öğretim yöntemlerine göre anlamlı olacak şekilde daha fazla artırdığını ortaya koymaktadır.

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A Comparative Case Study on The Effectiveness of Flipped Learning

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Abstract

The sage on stage is the traditional method of delivering teaching in which lecture transfers information to students and those students sit in desk, in rows, and quietly. They take notes. Normally lectures are followed up by assignments and maybe answering questions at the end of the chapter and final exams are demonstrated at the end of the courses.

In the past two decades with advance of technologies, there was a trend to move away from the traditional methods, and educationists have been working to break the teacher central apprise of instruction by shifting to leaner individuals, i.e., individualization. The approach of individualization works to reduce learning individual differences and assists learners to excel in their study. Technologies make it very possible to create a learning environment in which individualized instruction can be practice. While there is a need to consider for students' learning individual differences, also there a need to consider students' interaction with themselves and with their instruction. These considerations can be seen in Flipped learning, the instructional design that allows students to study individually at their pace and interact with others. Flipped learning shifts focus on the group learning space to the individuals learning space via using different and digital technologies shifts lectures based instance to individual instructions. Driscoll (2012) maintain that Flipped Learning can democratize the learning environment.

More quantity and quality research would to be needed to identify and explore the potentials of flipped learning model. The purpose of this case study is to look the effect of flipped learning on the academic performance of group of students taking curricula of general learning methods course. The study compares the performance of experimental group of students to the performance of control group student in the same course for one semester.

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1. Introduction:

The sage on stage is the traditional method of delivering instruction in which the lecturer transfers information to students who sit quietly in rows taking notes. Normally lectures are

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followed up by assignments and perhaps answering the questions at the end of the chapter. Learning is demonstrated at the end of courses by completion of final exams.

In the past two decades, with advance of technology, there has been a trend away from traditional methods, and educationists have been working to break the teacher centered approach by shifting to a learner as individuals focus, i.e., individualization. The individualization approach with technological support is assumed to reduce learners' individual differences and to assist learners to excel in their studies. Literature on integrating technology into teaching and learning shows technology makes it very possible to create a learning environment in which individualized instruction can be practiced. While there is a need to consider for students' individual learning differences, there is also a need to consider students' interaction with their peers and with their teachers. These two considerations can be seen in Flipped Learning, an approach that allows students to study individually at their own pace while interacting with others. Bergmann and Sams (2012) maintain, "Ultimately, flipping a classroom involves shifting the energy away from the instructor and toward the students and then leveraging educational tools to enhance the learning environment." Flipped learning can shift the focus from the group learning space to the individuals learning space by using different digital technologies which shift lectures based instruction to individual instruction (Hamdan, McKnight, McKnight, and Arfstrom:2013). Driscoll (2012) maintains that Flipped learning can democratize the learning environment.

In their study, Hamdan, McKnight, McKnight, and Arfstrom (2013) report that, of the teachers surveyed, 66% reported their students' standardized test scores increased after flipping their classrooms and 80% of teachers perceived an improvement in their students' attitudes towards learning. Nearly nine in ten of the teachers surveyed reported that their job satisfaction also improved, with 46% reporting significant improvement.

In his study, Driscoll (2012) surveyed 26 educators and 203 students from across the United States. 80% of students in flipped classrooms reported more access and exposure to course materials and instruction, improved ability to work at their own pace, more constant and positive interaction with teachers and peers during class time, and greater choice in how they demonstrated their learning

The existing literature clearly demonstrates that the Flipped Learning can be one way to create a classroom environment that is learner-centered. Irvin (2012), adds that active learning is at the root of the flipped classroom model of teaching. However, Hamdan et al., 2012,

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maintain that “The Flipped Learning model should by no means be thought of as a panacea for solving all educational issues; rather, it might be one way to enable learning”.

However, researchers believe there is a need for a greater quantity of quality research to identify and explore the potentials of the flipped learning model in different academic settings and environments. The purpose of this case study is to look the effect of flipped learning on the academic performance of a group of students taking "Curricula of General Learning Methods" course at Sohar University, Oman. The study compares the performance of an experimental group of students to the performance of control group student in the same course for one semester.

This is something that many teachers would like to do but are constrained by the current organization of schools and other barriers.

2. The Country and the University Context

Oman, with a population of only two million people is a small but nonetheless progressive and developing nation in the Middle East. With fossil fuel reserves dwindling in the foreseeable future the government has decided to strive to attain a knowledge-based economy to reduce dependence on the current resource based economy. By far the biggest factor currently holding us back is the lack of a well-grounded educational system in the country. The public school system in the country has only been in existence for the past forty years. Before that Oman only had three primary schools.

At Sohar University (SU), one of leading private universities in Sultanate of Oman, little consideration has been paid as regards to the importance of learning style as a factor to improve the educational experience of learners. Most lecturers use traditional passive approaches to course delivery. Nowadays, however, the university is in the process of encouraging a shift to active learning. This requires more individualization of instruction.

3. Study Design and instrumentation

The study took place in the first semester of the 2014-2015, academic year. Two groups of students studying the Curricula of General Learning Methods course were involved in this study. One group was a control group (46 students) whereas the second one was as an experimental group (24 students). The study was conducted for seven weeks, during the first half of the semester, two sessions per a week. That is to say the study was discontinued toward the end of the midterm exam.

Each evening, prior to face to face session the next day, a synchronized session was held by the instructor and the experimental group via a WhatsApp group (for half an hour, from 7 pm to 7:30 pm) to discuss the upcoming topic. Also the students were instructed to review the learning materials -details below- before coming to the class meeting.

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Each group met separately. In each face to face, the students in the two groups, the control group and the experimental group, first, were introduced to the session topic; and then divided into groups. Each group was assigned a task separately. The students were given time to discuss the tasks among themselves in groups and the instructor provided guidelines and clarification, when needed. The students brainstormed required information to do the activities and referred to the learning materials while performing tasks, if required. At the end of each session, the students presented and shared their tasks with the class and discussion was elicited. The students' presentations were posted in the university's learning management system (SULMS), as resources to be used in future. In the face to face sessions, learning was seen as a process of actively constructing knowledge; the learners played an active role in building their knowledge. However, the students in the experimental group were exposed to the learning materials prior to these sessions.

4. Flipped learning materials

The learning materials scheduled for the experimental group consisted of :

4.1 Video and audio clips:

Video and audio clips of recorded lectures by researcher and downloaded to the internet were shared with the students via WhatsApp. The videos were resized to be 5 to 10 mega bites and the length of each clip was 5-10 minutes in an attempt to retain the student's attention while viewing and to ease the transfer of the video files on to their mobile devices through the WhatsApp.

4.2 Document files:

PDF files, PowerPoint presentations and lecture notes were shared with the student via Dropbox, and links were sent to the students through WhatsApp.

5. Results of the study and discussion

The table (1) shows that the midterm exam results means and standard deviations (SD) for both groups. It can be said that the mean of experimental groups is slightly higher that the control group's; however, table 2 shows there is no significant difference in the midterm exam performance between the two groups.

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Table 1. Midterm result for experimental group and control group

MidtermExam Results	N	Mean	SD
Exp Group	24	13.21	2.81
Cont Group	46	12.40	2.89

Table 2. T Test for midterm exam result for experimental group and control group

T Test Midterm Exam Results	T	df	Sig
Exp Group	1.13	68	0.85
Cont Group	1.14	47.95	

Further comparative analysis was considered to determine whether the increase in mean result for the experimental group was due to the intervention-flipped learning or not, by looking at the students' performance in final exam. Table 3 shows the means and standard deviations (SD) for the two groups, and table 4 shows no significant difference in the final exam performance.

Table 3. Final exam result for experimental group and control group

Mid Exam Result	N	Mean	SD
Exp Group	24	34.45	4.80
Cont Group	46	35	6.91

Table 4. T Test for final exam result for experimental group and control group

T Test Mid Exam Result	T	df	Sig
Exp Group	-0.34	68	0.103
Cont Group	-0.38	47.9	

5. Conclusion

The researcher can conclude that the results of study indicate flipped learning had a minor impact on students' performance in constructive-technologies learning-rich environments where the students are seen as active learners and knowledge constructors. In the face to face learning environments the students in both groups were allowed to construct, discuss and share their knowledge. However, this result does not conflict with the existing research findings on the positive impact of flipped learning; this body of research compares traditional teaching methods, in which students are viewed as knowledge depositories, with flipped learning method which promotes active learning and technology use. Further research is needed to study the impact of flipped learning in constructive-technologies learning-rich environments.

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